

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

TECHNICAL NOTE 2435

DIRECT-READING DESIGN CHARTS FOR
75S-T6 ALUMINUM-ALLOY FLAT COMPRESSION PANELS
HAVING LONGITUDINAL EXTRUDED Z-SECTION STIFFENERS

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Washington

February 1952

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SUMMARY

Direct-reading design charts are presented for 75S-T6 aluminum-alloy flat compression panels having longitudinal extruded Z-section stiffeners. These charts, which cover a wide range of proportions, make possible the direct determination of the stress and all panel dimensions required to carry a given intensity of loading with a given skin thickness and effective length of panel.

INTRODUCTION

Design charts for wing compression panels have been presented in several different forms (see, for example, references 1 and 2) and have evolved over a period of years into the form presented in reference 3. This form permitted the direct selection of the various panel proportions which meet given values of the principal design conditions - intensity of loading, skin thickness, and effective length of panel. This form also made possible the ready determination of the proportions having minimum weight to meet these conditions.

In the present paper, direct-reading design charts similar to those of reference 3 are presented. These charts are based on the extensive test data contained in references 4 and 5 for 75S-T6 aluminum-alloy flat compression panels having longitudinal extruded Z-section stiffeners. The proportions covered vary from panels in which the stiffeners are relatively large, thick, and closely spaced (fig. 1) to panels in which the stiffeners are relatively thin compared to the skin and are small and widely spaced (fig. 2).

SYMBOLS

The symbols used for the panel dimensions are given in figure 3. In addition the following symbols are used:

c	coefficient of end fixity as used in Euler column formula
d	rivet diameter, inches
L	length of panel, inches
p	rivet pitch, inches
P_1	compressive load per inch of panel width, kips per inch
r	all fillet radii, inches
$\bar{t}$	cross-sectional area per inch of panel width, expressed as an equivalent or average thickness, inches
ρ	radius of gyration, inches
$\bar{\sigma}_f$	average stress at failing load, ksi
σ_{cr}	stress for local buckling of sheet, ksi
σ_{cy}	compressive yield stress, ksi

DIRECT-READING DESIGN CHARTS

Direct-reading design charts for 75S-T6 aluminum-alloy flat compression panels with longitudinal extruded Z-section stiffeners having the properties and proportions given in tables 1 to 8 are presented in two forms in figures 4 to 17.

First form.- In the first form (figs. 4 to 10), the design conditions of intensity of loading, effective length of panel, and skin thickness are incorporated in the ordinate P_1/t_s and the abscissa $\frac{P_1}{L/\sqrt{c}}$. This form, having the design conditions incorporated in the ordinate and abscissa, is the more useful for most design purposes because the curves

are more widely spaced and interpolation is more straightforward.

Second (alternate) form.- In the second form (figs. 11 to 17), the average stress at failure $\bar{\sigma}_f$ is plotted against P_1/t_S as was done in the summary plots of reference 6. This alternate form, having the stress (an inverse measure of weight for a given load) as ordinate, is often the more useful for making generalizations and comparisons of structural efficiency. Such comparisons may readily be made because the charts show directly how nearly the stress actually carried approaches the upper-limit stress corresponding to that which would be achieved by a pure shell construction if a pure shell could carry the load without failure. This upper-limit stress is represented by the lines for $\bar{\sigma}_f = \frac{P_1}{t_S}$ (infinite stiffener spacing) in figures 11 to 17.

From either form of chart the panel proportions which will satisfy the design conditions may be found directly. Values of the ratios of stiffener thickness to skin thickness t_W/t_S , stiffener spacing to skin thickness b_S/t_S , and height of stiffener to stiffener thickness H/t_W may be found directly for given values of P_1/t_S and $\frac{P_1}{L/\sqrt{c}}$, and the corresponding section properties $\bar{t}/t_S$, $\bar{h}/t_S$, and ρ/t_S may be found from tables 2 to 8.

Because several different quantities are presented simultaneously on these charts, several broken- and solid-line conventions have been used to distinguish among them. For example, in the first form of design chart (figs. 4 to 10) dashed lines are used to indicate values of average stress at failure $\bar{\sigma}_f$; whereas, on the alternate form of design chart (figs. 11 to 17) dashed lines are used to indicate values of $\frac{P_1}{L/\sqrt{c}}$. In both forms the value of $\bar{\sigma}_f$ corresponding to the point at which each curve is cut by a short heavy line is the value of the stress for local buckling σ_{cr} for the proportions represented by the

curve. For example, the value of σ_{cr} for $\frac{H}{t_W} = 16$ and $\frac{b_S}{t_S} = 20$ in figure 4 is approximately 61 ksi. (Only a very short panel of these proportions would buckle before failure - one having a value of

$\frac{P_1}{L/\sqrt{c}} \geq 3.75$.) If the value of σ_{cr} is so low that the short heavy line would fall outside the boundaries of the chart, a numerical value of σ_{cr} is given and is associated with the proper proportions by a leader

to the curve. For a few of the extreme proportions, namely, panels having very small stiffeners very widely spaced, the value of σ_{cr} is not independent of the panel length. For such proportions the value of σ_{cr} given in the design charts will be too low if the panel length is short, and reference to the actual test data (references 4 and 5) is suggested if more definite values of σ_{cr} for such panels are required.

The panel proportions which have minimum weight are indicated on both forms of these charts by the use of colors as follows:

(1) If the proportions correspond to a blue line or region, they are the proportions which give the lightest possible 75S-T6 Z-stiffened panel which will meet the design conditions

(2) If the proportions correspond to a red line or region, they are the proportions which give the lightest possible 75S-T6 Z-stiffened panel at the ratio of stiffener thickness to skin thickness given by that particular chart, but some other thickness ratio would give a lighter design

(3) If the proportions correspond to a white region, the panel will meet the design conditions but will not be the lightest panel which will meet the conditions

Because in many cases the proportions may be varied somewhat from those indicated by the red and blue colors to have minimum weight, with little change in the value of the stress that can be carried, too much importance should not be attached to the exact proportions associated with the red or blue colors. In any particular case for which a deviation from the minimum-weight proportions is made, however, caution dictates that the weight penalty associated with this deviation be determined.

The stresses achieved by the panels having the proportions indicated in the design charts to have minimum weight are summarized in figures 18 and 19. Figure 18 covers the most general case, in which no minimum skin thickness is required. In this case curves of $\bar{\sigma}_f$ against the structural index $\frac{P_1}{L\sqrt{c}}$ (reference 7) measure the panel structural efficiency.

Inasmuch as the required sheet thickness in the design of wing compression panels is often dictated by the torsional-stiffness requirements of the wing, curves showing the effect of a variation in sheet thickness upon the maximum stress that can be carried provide an evaluation of the panel structural efficiency which is applicable in many cases not covered by figure 18. In figure 19, such curves of $\bar{\sigma}_f$

against the parameter P_1/t_S for a series of values of the structural index $\frac{P_1}{L\sqrt{c}}$ are presented for the 75S-T6 Z-stiffened panels.

Figure 19 is similar to the summary plots of reference 6 for 24S-T aluminum-alloy Z-stiffened panels and 24S-T and 75S-T aluminum-alloy Y-stiffened panels.

USE OF THE DIRECT-READING DESIGN CHARTS

The manner of using the direct-reading design charts depends in some measure on the desired degree of precision of interpolation among the curves. For many purposes, interpolation by inspection is of adequate accuracy, and the use of the charts requires only the calculation of the values of the design parameters P_1/t_S and $\frac{P_1}{L\sqrt{c}}$ to permit the desired proportions to be read directly from the curves. The proportions for minimum weight, moreover, may be found directly as those corresponding to the blue lines or regions on the curves.

If more accurate interpolation is desired, a plot can readily be made of H/t_W , $\bar{\sigma}_F$, and σ_{cr} against b_S/t_S (or S/t_S) at the given values of P_1/t_S and $\frac{P_1}{L\sqrt{c}}$ and the proportions can be picked from it.

On a plot of this type, the proportions for minimum weight correspond to those associated with the highest value of $\bar{\sigma}_F$. This plot, which is described in more detail in connection with the illustrative example of the following section, is the same as that used with previously available design charts (references 2 and 6).

As a check on the accuracy of interpolation, the product of the cross-sectional area per inch of width of the design and the stress that the charts indicate should be achieved by the design may be compared with the design value of the intensity of loading. For this purpose values of $\bar{t}/t_S$ may be found from tables 2 to 8 and the corresponding values of cross-sectional area per inch $\bar{t}$ obtained by multiplying by the skin thickness t_S .

The value of $\bar{\sigma}_F$ obtained from the design charts can be achieved only if the panels are riveted with large-diameter, closely spaced rivets that have essentially the same strength characteristics as Al7S-T4 aluminum-alloy flat-head rivets (AN442AD) used on the test specimens of references 4 and 5. Reference 8 presents curves for

determining the rivet diameter and pitch required to insure the development of a given average stress for local instability; these curves may be used as a guide for estimating the effect of a variation in riveting.

ILLUSTRATIVE EXAMPLE

In order to illustrate the use of the direct-reading design charts and the simplicity of the computations associated with them, a panel will be designed for minimum weight to meet the same principal design conditions used to illustrate the design procedures in reference 2, namely:

(1) Intensity of loading $P_i = 3.0$ kips per inch

(2) Skin thickness $t_S = 0.064$ inch

(3) Effective length $\frac{L}{\sqrt{c}} = 20$ inches

First the values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ are calculated

$$\frac{P_i}{t_S} = \frac{3.0}{0.064}$$

$$= 46.9 \text{ ksi}$$

$$\frac{P_i}{L/\sqrt{c}} = \frac{3.0}{20}$$

$$= 0.15 \text{ ksi}$$

Then a trial value of t_W/t_S is assumed. If desired, figure 19 may be used to aid in the selection of a suitable skin-stiffener thickness ratio. For the example, however, an arbitrary value of $\frac{t_W}{t_S} = 1.00$ will be used. In the chart for this value of t_W/t_S (fig. 10) the points corresponding to the design values of P_i/t_S and $\frac{P_i}{L/\sqrt{c}}$ lie on

the red line at $\frac{H}{t_W} = 21$ (or $\frac{b_W}{t_W} = 20$). Accordingly, the value of H/t_W for minimum weight for $\frac{t_W}{t_S} = 1.00$ is 21, and, because the

value is established by a red line, not a blue line, some value of t_W/t_S other than 1.00 will give less weight. Inspection of the charts for other values of t_W/t_S reveals that at the given design values

of P_1/t_S and $\frac{P_1}{L/\sqrt{c}}$ the blue region lies between $\frac{H}{t_W} = 26$ and

$\frac{H}{t_W} = 31$ on the chart for $\frac{t_W}{t_S} = 0.79$ (fig. 9). By interpolation, the

panel proportions corresponding to this blue region are found to be

$\frac{H}{t_W} \approx 28$ ($\frac{b_W}{t_W} \approx 27$) and $\frac{S}{t_S} = \frac{b_S}{t_S} \approx 53.5$, and for these proportions

$\bar{\sigma}_F \approx 30.0$ ksi and $\sigma_{cr} \approx 14.5$ ksi. The actual panel dimensions are calculated from these proportions as

$$\begin{aligned} t_W &= \frac{t_W}{t_S} t_S \\ &= 0.79 \times 0.064 \\ &\approx 0.051 \text{ inch} \end{aligned}$$

$$\begin{aligned} H &= \frac{H}{t_W} t_W \\ &= 28 \times 0.051 \\ &= 1.43 \text{ inches} \end{aligned}$$

$$\begin{aligned} S &= \frac{S}{t_S} t_S \\ &= 53.5 \times 0.064 \\ &= 3.42 \text{ inches} \end{aligned}$$

and the section properties can be determined from table 7 as

$$\begin{aligned}\bar{h} &= \frac{\bar{h}}{t_S} t_S \\ &= 4.71 \times 0.064 \\ &= 0.302 \text{ inch}\end{aligned}$$

$$\begin{aligned}\rho &= \frac{\rho}{t_S} t_S \\ &= 7.59 \times 0.064 \\ &= 0.485 \text{ inch}\end{aligned}$$

In order to illustrate the use of the direct-reading design charts when more accuracy than that corresponding to interpolation by inspection is desired, a plot has been made (fig. 20) of the values of $\bar{\sigma}_f$, σ_{cr} ,

and H/t_W given by the charts at the design values of P_1/t_S and $\frac{P_1}{L/\sqrt{c}}$. The proportions which give the highest value of $\bar{\sigma}_f$ can be

readily selected from a plot of this kind. For the example these proportions are so nearly the same as were obtained by inspection that the values will not be repeated.

As a check on the accuracy of interpolation, the magnitude of $\bar{t}/t_S$ for these proportions can be determined from table 7 and multiplied by the values of t_S and $\bar{\sigma}_f$ for the design. This product should be equal to the design value of P_1 .

For the example (see fig. 20)

$$\bar{\sigma}_f = 30.0 \text{ ksi}$$

$$\frac{\bar{t}}{t_S} = 1.554$$

and

$$\begin{aligned}P_1 &= \bar{\sigma}_f \bar{t} \\&= \bar{\sigma}_f \frac{\bar{t}}{t_S} t_S \\&= 30.0 \times 1.554 \times 0.064 \\&= 3.0 \text{ kips per inch}\end{aligned}$$

which agrees with the design value of P_1 originally assumed.

Langley Aeronautical Laboratory
National Advisory Committee for Aeronautics
Langley Field, Va., May 4, 1951

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TABLE 1. - MATERIAL PROPERTIES AND PROPORTIONS
OF 75S-T6 ALUMINUM-ALLOY PANELS HAVING
EXTRUDED Z-SECTION STIFFENERS

[For details of stiffener proportions and diameter and pitch of rivets, see tables 2 to 8; for panel dimensions see fig. 1]

Material Properties		
	Aluminum Alloy	σ_{cy} (ksi)
Sheet	75S-T6 (nonclad)	74.4
Stiffeners	75S-T6 extruded	79.0
Range of Proportions Tested (References 4 and 5)		
$\frac{t_W}{t_S}$ from 0.25 to 1.00		
$\frac{b_S}{t_S}$ from 15 to 75		
$\frac{b_W}{t_W}$ from 12 to 40		
$\left(\frac{L}{P}\right) \approx 3.75$ from 20 to 125		



TABLE 2.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.25$; $\frac{b_A}{t_W} = 20.3$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.75$; $\frac{p}{t_S} = 5.00$)

$\frac{b_W}{t_S}$	$\frac{t_W}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
15	1.143	1.149	1.155	1.160	1.166	1.172	1.178	1.184	1.190	1.201	1.213	1.225	1.230	1.238	1.248	1.260	1.277	1.289	1.295	1.318	1.347	
16	1.133	1.140	1.145	1.150	1.156	1.161	1.167	1.172	1.177	1.189	1.200	1.211	1.216	1.221	1.232	1.243	1.260	1.271	1.278	1.299	1.325	
17	1.128	1.131	1.136	1.142	1.147	1.152	1.157	1.162	1.167	1.178	1.188	1.196	1.203	1.209	1.219	1.229	1.245	1.255	1.260	1.281	1.306	
18	1.119	1.124	1.129	1.134	1.139	1.143	1.148	1.153	1.158	1.168	1.178	1.187	1.192	1.197	1.207	1.216	1.231	1.241	1.245	1.265	1.289	
19	1.114	1.117	1.122	1.127	1.131	1.136	1.141	1.145	1.150	1.159	1.168	1.177	1.182	1.187	1.196	1.205	1.219	1.228	1.233	1.251	1.274	
20	1.107	1.112	1.116	1.120	1.125	1.129	1.133	1.138	1.142	1.151	1.160	1.168	1.173	1.177	1.186	1.195	1.208	1.217	1.221	1.238	1.260	
21	1.102	1.108	1.110	1.115	1.119	1.123	1.127	1.131	1.135	1.144	1.152	1.160	1.165	1.169	1.177	1.185	1.198	1.208	1.210	1.227	1.248	
22	1.097	1.101	1.105	1.109	1.113	1.117	1.121	1.125	1.129	1.137	1.145	1.153	1.157	1.161	1.169	1.177	1.189	1.197	1.199	1.217	1.237	
23	1.093	1.097	1.101	1.105	1.108	1.112	1.116	1.120	1.124	1.131	1.139	1.147	1.150	1.154	1.162	1.169	1.181	1.188	1.192	1.207	1.227	
24	1.089	1.093	1.097	1.100	1.104	1.108	1.111	1.115	1.119	1.126	1.133	1.140	1.144	1.148	1.155	1.162	1.173	1.180	1.184	1.199	1.217	
25	1.086	1.089	1.093	1.096	1.100	1.103	1.107	1.110	1.114	1.121	1.128	1.135	1.138	1.142	1.149	1.156	1.168	1.173	1.177	1.191	1.208	
26	1.083	1.086	1.089	1.093	1.096	1.099	1.103	1.106	1.109	1.116	1.123	1.130	1.133	1.136	1.143	1.150	1.160	1.167	1.170	1.183	1.200	
27	1.079	1.083	1.086	1.089	1.092	1.096	1.099	1.102	1.105	1.112	1.118	1.125	1.128	1.131	1.138	1.144	1.154	1.160	1.164	1.177	1.193	
28	1.077	1.080	1.083	1.086	1.089	1.092	1.095	1.098	1.102	1.108	1.114	1.120	1.123	1.127	1.133	1.139	1.148	1.155	1.158	1.170	1.186	
29	1.074	1.077	1.080	1.083	1.086	1.089	1.092	1.095	1.098	1.104	1.110	1.116	1.119	1.122	1.128	1.134	1.143	1.149	1.152	1.164	1.180	
30	1.071	1.074	1.077	1.080	1.083	1.086	1.089	1.092	1.095	1.101	1.107	1.112	1.115	1.118	1.124	1.130	1.139	1.144	1.147	1.159	1.174	
31	1.069	1.072	1.075	1.078	1.080	1.083	1.086	1.089	1.092	1.097	1.103	1.109	1.111	1.114	1.120	1.126	1.134	1.140	1.143	1.154	1.168	
32	1.067	1.070	1.073	1.075	1.078	1.080	1.083	1.086	1.089	1.094	1.100	1.105	1.108	1.111	1.116	1.122	1.130	1.135	1.138	1.149	1.163	
33	1.065	1.068	1.070	1.073	1.076	1.078	1.081	1.084	1.086	1.092	1.097	1.102	1.105	1.107	1.113	1.118	1.126	1.131	1.134	1.145	1.158	
34	1.063	1.066	1.068	1.071	1.073	1.076	1.079	1.081	1.084	1.089	1.094	1.099	1.102	1.104	1.109	1.115	1.123	1.127	1.130	1.140	1.153	
35	1.061	1.064	1.066	1.069	1.071	1.074	1.076	1.079	1.081	1.086	1.091	1.097	1.099	1.101	1.106	1.111	1.119	1.124	1.128	1.138	1.149	
36	1.060	1.062	1.064	1.067	1.069	1.072	1.074	1.077	1.079	1.084	1.089	1.094	1.098	1.098	1.103	1.108	1.116	1.120	1.123	1.133	1.145	
37	1.058	1.060	1.063	1.065	1.067	1.070	1.072	1.075	1.077	1.082	1.086	1.091	1.093	1.096	1.101	1.105	1.112	1.117	1.119	1.129	1.141	
38	1.056	1.059	1.061	1.063	1.066	1.068	1.070	1.073	1.075	1.079	1.084	1.089	1.091	1.093	1.098	1.103	1.109	1.114	1.116	1.126	1.137	
39	1.055	1.057	1.060	1.062	1.064	1.068	1.068	1.071	1.073	1.077	1.082	1.086	1.089	1.091	1.095	1.100	1.107	1.111	1.113	1.122	1.134	
40	1.054	1.056	1.058	1.060	1.062	1.065	1.067	1.069	1.071	1.075	1.080	1.084	1.088	1.089	1.093	1.097	1.104	1.108	1.110	1.119	1.130	
42	1.051	1.053	1.055	1.057	1.059	1.062	1.064	1.066	1.068	1.072	1.076	1.080	1.082	1.084	1.089	1.093	1.099	1.103	1.105	1.114	1.124	
44	1.049	1.051	1.053	1.055	1.057	1.059	1.061	1.063	1.065	1.069	1.073	1.077	1.079	1.081	1.085	1.089	1.095	1.098	1.100	1.108	1.118	
46	1.047	1.049	1.050	1.052	1.054	1.056	1.058	1.060	1.062	1.066	1.069	1.073	1.075	1.077	1.081	1.085	1.090	1.094	1.096	1.104	1.113	
48	1.045	1.047	1.048	1.050	1.052	1.054	1.056	1.057	1.059	1.063	1.067	1.070	1.072	1.074	1.078	1.081	1.087	1.090	1.092	1.099	1.109	
50	1.043	1.045	1.046	1.048	1.050	1.052	1.053	1.055	1.057	1.060	1.064	1.068	1.069	1.071	1.074	1.078	1.083	1.087	1.088	1.095	1.104	
52	1.041	1.043	1.045	1.046	1.048	1.050	1.051	1.053	1.055	1.058	1.061	1.065	1.068	1.068	1.072	1.075	1.080	1.083	1.085	1.092	1.100	
54	1.040	1.041	1.043	1.045	1.046	1.048	1.049	1.051	1.053	1.056	1.059	1.062	1.064	1.066	1.069	1.072	1.077	1.080	1.082	1.088	1.096	
56	1.038	1.040	1.041	1.043	1.045	1.046	1.048	1.049	1.051	1.054	1.057	1.060	1.062	1.063	1.066	1.070	1.074	1.077	1.079	1.085	1.092	
58	1.037	1.039	1.040	1.041	1.043	1.045	1.046	1.048	1.049	1.052	1.055	1.058	1.060	1.061	1.064	1.067	1.072	1.075	1.078	1.083	1.090	
60	1.036	1.037	1.039	1.040	1.042	1.043	1.045	1.046	1.047	1.050	1.053	1.056	1.058	1.059	1.062	1.065	1.069	1.072	1.074	1.080	1.087	
63	1.034	1.035	1.037	1.039	1.040	1.041	1.042	1.044	1.045	1.048	1.051	1.054	1.055	1.056	1.059	1.062	1.066	1.069	1.070	1.076	1.083	
66	1.033	1.034	1.035	1.036	1.038	1.039	1.040	1.042	1.043	1.046	1.048	1.051	1.052	1.054	1.058	1.059	1.063	1.066	1.067	1.072	1.079	
69	1.031	1.032	1.034	1.035	1.036	1.037	1.039	1.040	1.041	1.044	1.046	1.048	1.050	1.051	1.054	1.056	1.060	1.063	1.064	1.069	1.076	
72	1.030	1.031	1.032	1.033	1.035	1.036	1.037	1.038	1.040	1.042	1.044	1.047	1.048	1.049	1.052	1.054	1.058	1.060	1.061	1.066	1.072	
75	1.029	1.030	1.031	1.032	1.033	1.034	1.036	1.037	1.038	1.040	1.043	1.045	1.048	1.047	1.050	1.052	1.055	1.058	1.059	1.064	1.069	
78	1.028	1.029	1.030	1.031	1.032	1.033	1.034	1.035	1.037	1.039	1.041	1.043	1.044	1.045	1.048	1.050	1.053	1.056	1.057	1.061	1.067	
81	1.027	1.028	1.029	1.030	1.031	1.032	1.033	1.034	1.035	1.037	1.039	1.042	1.043	1.044	1.046	1.048	1.051	1.053	1.055	1.059	1.064	
84	1.026	1.027	1.028	1.029	1.030	1.031	1.032	1.033	1.034	1.036	1.038	1.040	1.041	1.042	1.044	1.046	1.050	1.052	1.053	1.057	1.062	
15	.6602	.6797	.7006	.7230	.7466	.7717	.7982	.8269	.8549	.9169	.9838	1.056	1.093	1.132	1.213	1.299	1.435	1.531	1.581	1.789	2.070	
16	.6513	.6698	.6897	.7109	.7333	.7571	.7823	.8095	.8361	.8950	.9586	1.027	1.063	1.100	1.177	1.259	1.399	1.480	1.528	1.727	1.996	
17	.6435	.6610	.6798	.7000	.7213	.7440	.7678	.7929	.8192	.8752	.9359	1.001	1.035	1.071	1.144	1.222	1.347	1.434	1.480	1.671	1.929	
18	.6363	.6530	.6710	.6902	.7103	.7321	.7549	.7788	.8039	.8574	.9154	.9775	1.010	1.044	1.115	1.189	1.309	1.393	1.436	1.619	1.867	
19	.6299	.6459	.6630	.6813	.7007	.7214	.7431	.7660	.7899	.8412	.8986	.9562	.9878	1.020	1.093	1.159	1.274	1.354	1.396	1.572	1.811	
20	.6240	.6393	.6557	.6732	.6918	.7115	.7324	.7543	.7773	.8284	.8859	.9436	.9868	.9979	1.063	1.132	1.242	1.319	1.360	1.529	1.759	
21	.6186	.6333	.6490	.6658	.6836	.7026	.7226	.7436	.7656	.8127	.8638	.9188	.9477	.9775	1.040	1.108	1.212	1.287	1.328	1.489	1.711	
22	.6138	.6278	.6429	.6590	.6761	.6944	.7138	.7337	.7549	.8003	.8494	.9023	.9301	.9588	1.019	1.083	1.185	1.257	1.294	1.452	1.665	
23	.6082	.6227	.6372	.6528	.6693	.6868	.7052	.7247	.7451	.7888	.8360	.8870	.9139	.9416	.9997	1.061	1.160	1.229	1.265	1.418	1.625	
24	.6051	.6180	.6320	.6470	.6629	.6797	.6975	.7163	.7359	.7780	.8237	.8729	.8988	.9255	.9816	1.041	1.136	1.204	1.239	1.386	1.586	
25	.6011	.6137	.6271	.6416	.656																	

TABLE 2.- Z-PANEL PROPERTIES $\left(\frac{b_W}{t_S} = 0.25; \frac{b_A}{t_W} = 20.3; \frac{b_F}{t_W} = 0.4; \frac{d}{t_S} = 1.75; \frac{p}{t_S} = 5.00\right)$ - Concluded

$\frac{b_W}{t_S}$	$\frac{b_A}{t_W}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45	
37		.5701	.5789	.5883	.5985	.6093	.6207	.6328	.6456	.6589	.6727	.6870	.7018	.7170	.7328	.7491	.7659	.7831	.8007	.8187	1.007	1.110	1.252
38		.5694	.5770	.5862	.5960	.6065	.6177	.6296	.6420	.6551	.6682	.6823	.6968	.7117	.7270	.7428	.7591	.7758	.7928	.8101	1.008	1.234	
39		.5687	.5761	.5841	.5937	.6040	.6149	.6264	.6388	.6513	.6648	.6786	.6928	.7074	.7224	.7378	.7536	.7698	.7863	.8031	1.002	1.218	
40		.5681	.5753	.5821	.5915	.6016	.6122	.6235	.6354	.6478	.6607	.6740	.6878	.7019	.7164	.7313	.7466	.7623	.7782	.7943	1.009	1.202	
42		.5622	.5700	.5784	.5874	.5970	.6071	.6180	.6293	.6412	.6536	.6664	.6796	.6931	.7069	.7210	.7355	.7503	.7654	.7807	1.045	1.172	
44		.5595	.5670	.5750	.5836	.5928	.6025	.6129	.6238	.6352	.6471	.6594	.6720	.6849	.6981	.7116	.7254	.7394	.7537	.7682	1.023	1.145	
46		.5570	.5642	.5719	.5802	.5890	.5983	.6083	.6187	.6297	.6412	.6533	.6658	.6786	.6917	.7050	.7186	.7325	.7466	.7608	1.002	1.120	
48		.5547	.5616	.5691	.5770	.5854	.5944	.6040	.6140	.6246	.6357	.6472	.6589	.6709	.6832	.6957	.7084	.7213	.7344	.7476	1.003	1.098	
50		.5527	.5593	.5664	.5741	.5822	.5909	.6000	.6097	.6198	.6303	.6412	.6523	.6636	.6751	.6868	.6987	.7107	.7229	.7353	1.002	1.075	
52		.5507	.5571	.5640	.5713	.5792	.5876	.5964	.6057	.6155	.6258	.6365	.6474	.6584	.6695	.6808	.6922	.7038	.7155	.7274	1.000	1.055	
54		.5489	.5551	.5617	.5688	.5764	.5844	.5930	.6020	.6114	.6213	.6316	.6422	.6530	.6639	.6749	.6860	.6972	.7085	.7200	1.000	1.038	
56		.5472	.5532	.5598	.5670	.5738	.5816	.5903	.5995	.6092	.6193	.6297	.6403	.6510	.6618	.6727	.6837	.6948	.7060	.7174	1.000	1.018	
58		.5456	.5514	.5578	.5643	.5713	.5789	.5868	.5953	.6041	.6131	.6233	.6336	.6440	.6545	.6651	.6758	.6865	.6973	.7082	1.000	1.002	
60		.5442	.5499	.5563	.5622	.5690	.5764	.5841	.5922	.6008	.6097	.6189	.6292	.6395	.6499	.6604	.6710	.6817	.6924	.7032	1.000	1.000	
63		.5421	.5475	.5532	.5593	.5659	.5728	.5802	.5880	.5962	.6048	.6136	.6226	.6317	.6409	.6502	.6596	.6690	.6784	.6878	1.000	1.000	
66		.5403	.5454	.5509	.5567	.5630	.5697	.5767	.5841	.5920	.6003	.6089	.6177	.6267	.6358	.6449	.6541	.6633	.6725	.6817	1.000	1.000	
69		.5388	.5435	.5487	.5544	.5604	.5667	.5735	.5807	.5882	.6043	.6219	.6410	.6611	.6816	.7024	.7234	.7445	.7657	.7869	1.000	1.000	
72		.5370	.5417	.5468	.5522	.5579	.5640	.5705	.5774	.5846	.6002	.6170	.6354	.6541	.6732	.6924	.7117	.7311	.7506	.7701	1.000	1.000	
75		.5356	.5401	.5449	.5501	.5557	.5616	.5678	.5744	.5814	.5983	.6156	.6332	.6511	.6692	.6874	.7057	.7241	.7426	.7611	1.000	1.000	
78		.5342	.5386	.5433	.5483	.5536	.5594	.5653	.5717	.5783	.5927	.6084	.6244	.6404	.6565	.6727	.6889	.7052	.7215	.7378	1.000	1.000	
81		.5330	.5372	.5417	.5465	.5517	.5572	.5630	.5691	.5755	.5894	.6048	.6207	.6368	.6529	.6690	.6852	.7014	.7177	.7339	1.000	1.000	
84		.5319	.5359	.5403	.5449	.5499	.5552	.5608	.5667	.5729	.5864	.6010	.6168	.6325	.6483	.6641	.6800	.6958	.7117	.7275	1.000	1.000	
15		.8021	.6574	.7159	.7773	.8415	.9061	.9768	1.048	1.120	1.271	1.429	1.589	1.672	1.756	1.927	2.102	2.371	2.654	2.647	3.025	3.510	
16		.5901	.6438	.7006	.7605	.8230	.8878	.9549	1.024	1.095	1.242	1.397	1.554	1.635	1.718	1.885	2.057	2.321	2.602	2.593	2.985	3.442	
17		.5781	.6313	.6866	.7449	.8058	.8691	.9346	1.002	1.072	1.215	1.367	1.521	1.601	1.681	1.846	2.013	2.275	2.452	2.542	2.908	3.379	
18		.5689	.6197	.6735	.7304	.7898	.8518	.9158	.9817	1.050	1.191	1.339	1.490	1.568	1.647	1.809	1.975	2.230	2.405	2.493	2.854	3.318	
19		.5593	.6088	.6614	.7188	.7749	.8353	.8979	.9625	1.029	1.167	1.313	1.461	1.537	1.615	1.774	1.937	2.189	2.360	2.447	2.803	3.261	
20		.5506	.5988	.6500	.7042	.7609	.8201	.8813	.9446	1.010	1.145	1.288	1.433	1.508	1.585	1.742	1.902	2.149	2.318	2.404	2.754	3.206	
21		.5424	.5894	.6394	.6923	.7479	.8057	.8657	.9277	.9916	1.124	1.265	1.408	1.482	1.557	1.710	1.868	2.112	2.278	2.363	2.708	3.154	
22		.5347	.5805	.6295	.6812	.7356	.7922	.8510	.9118	.9745	1.105	1.243	1.383	1.456	1.530	1.681	1.836	2.076	2.240	2.324	2.664	3.105	
23		.5274	.5722	.6201	.6707	.7240	.7795	.8372	.8968	.9563	1.086	1.222	1.360	1.431	1.504	1.653	1.806	2.042	2.204	2.287	2.622	3.057	
24		.5206	.5642	.6112	.6609	.7130	.7675	.8240	.8826	.9430	1.069	1.202	1.338	1.408	1.480	1.627	1.777	2.010	2.170	2.251	2.582	3.012	
25		.5142	.5571	.6030	.6515	.7027	.7562	.8117	.8692	.9285	1.052	1.183	1.317	1.386	1.457	1.601	1.750	1.980	2.137	2.217	2.544	2.968	
26		.5081	.5500	.5950	.6427	.6929	.7453	.7998	.8563	.9147	1.038	1.165	1.297	1.365	1.435	1.577	1.724	1.950	2.106	2.185	2.508	2.927	
27		.5024	.5435	.5875	.6343	.6836	.7351	.7887	.8443	.9016	1.021	1.148	1.278	1.345	1.414	1.554	1.698	1.922	2.078	2.154	2.473	2.887	
28		.4970	.5372	.5804	.6283	.6747	.7254	.7780	.8327	.8892	1.007	1.132	1.260	1.326	1.394	1.532	1.675	1.895	2.047	2.124	2.439	2.848	
29		.4919	.5312	.5737	.6187	.6633	.7181	.7679	.8217	.8773	.9933	1.117	1.242	1.308	1.375	1.511	1.652	1.870	2.019	2.095	2.405	2.811	
30		.4870	.5256	.5672	.6115	.6553	.7071	.7583	.8112	.8658	.9801	1.102	1.226	1.291	1.358	1.491	1.632	1.845	1.993	2.068	2.378	2.776	
31		.4823	.5202	.5611	.6046	.6486	.6988	.7490	.8011	.8550	.9677	1.088	1.210	1.274	1.339	1.472	1.609	1.821	1.967	2.041	2.350	2.742	
32		.4778	.5150	.5553	.5980	.6422	.6897	.7401	.7914	.8446	.9554	1.074	1.195	1.258	1.322	1.453	1.588	1.793	1.943	2.018	2.317	2.703	
33		.4736	.5101	.5497	.5917	.6363	.6829	.7316	.7822	.8348	.9442	1.061	1.180	1.242	1.305	1.435	1.569	1.778	1.919	1.992	2.289	2.677	
34		.4698	.5054	.5443	.5857	.6295	.6755	.7235	.7734	.8250	.9331	1.048	1.168	1.227	1.290	1.418	1.550	1.755	1.898	1.969	2.263	2.646	
35		.4657	.5010	.5392	.5800	.6231	.6684	.7157	.7649	.8158	.9225	1.036	1.152	1.213	1.275	1.401	1.532	1.735	1.874	1.945	2.237	2.617	
36		.4619	.4967	.5343	.5744	.6169	.6615	.7082	.7567	.8069	.9122	1.024	1.140	1.199	1.260	1.386	1.515	1.715	1.853	1.924	2.212	2.588	
37		.4583	.4925	.5298	.5691	.6109	.6550	.7009	.7488	.7984	.9023	1.013	1.127	1.186	1.246	1.370	1.498	1.698	1.833	1.902	2.188	2.560	
38		.4549	.4886	.5250	.5640	.6053	.6486	.6940	.7413	.7902	.8928	1.002	1.115	1.173	1.233	1.355	1.482	1.678	1.813	1.882	2.164	2.533	
39		.4517	.4847	.5207	.5590	.5997	.6428	.6873	.7340	.7822	.8838	.9919	1.103	1.161	1.220	1.341	1.468	1.660	1.794	1.863	2.142	2.507	
40		.4485	.4811	.5165	.5543	.5944	.6365	.6809	.7269	.7746	.8748	.9818	1.092	1.149	1.207	1.327	1.451	1.643	1.775	1.843	2.120	2.482	
42		.4426	.4742	.5095	.5453	.5844	.6256	.6686	.7135	.7601	.8579	.9625	1.070	1.128	1.183	1.300	1.422	1.610	1.740	1.808	2.078	2.433	
44		.4370	.4677	.5011	.5369	.5750	.6152	.6572	.7010	.7466	.8422	.9445	1.050	1.105	1.161	1.278	1.394	1.579	1.707	1.772	2.039	2.388	
46		.4318	.4617	.4943	.5291	.5662	.6064	.6485	.6933	.7398	.8324	.9326	1.031	1.083	1.139	1.252	1.369	1.550	1.675	1.739	2.002	2.345	
48		.4271	.4562	.4878	.5218	.5581	.5961	.6364	.6793	.7219	.8137	.9117	1.013	1.065	1.119	1.230	1.344	1.523	1.648	1.708	1.966	2.304	
50		.4226	.4505	.4817	.5149	.5504	.5877	.6270	.6680	.7107	.8004	.8967	.9953	1.093	1.140	1.209	1.322	1.497	1.618	1.679	1.933	2.265	
52		.4184	.4459	.4761	.5081	.5431	.5798	.6180	.6582	.7000	.7881	.8825	.9798	1.071	1.118	1.189	1.300	1.472	1.591	1.652	1.901	2.228	
54		.4144	.4413	.4707	.5024	.5362	.5720	.6098	.6490	.6900	.7763	.8690	.9648	1.056	1.103	1.171	1.279	1.449	1.568	1.625	1.871	2.193	

TABLE 3.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.31$; $\frac{b_A}{t_W} = 16.3$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.69$; $\frac{p}{t_S} = 4.91$)

$\frac{b_W}{t_W}$	$\frac{b_S}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	38	40	45
15	15	1.220	1.229	1.238	1.247	1.256	1.265	1.274	1.283	1.292	1.309	1.327	1.345	1.354	1.363	1.381	1.399	1.428	1.444	1.453	1.489	1.534
16	16	1.206	1.214	1.223	1.231	1.240	1.248	1.257	1.265	1.273	1.290	1.307	1.324	1.332	1.341	1.357	1.374	1.399	1.416	1.425	1.458	1.500
17	17	1.194	1.202	1.210	1.218	1.228	1.234	1.241	1.249	1.257	1.273	1.289	1.305	1.313	1.321	1.336	1.352	1.376	1.392	1.400	1.431	1.471
18	18	1.183	1.191	1.198	1.206	1.213	1.221	1.228	1.236	1.243	1.258	1.273	1.288	1.295	1.303	1.318	1.333	1.355	1.370	1.377	1.407	1.445
19	19	1.174	1.181	1.188	1.195	1.202	1.209	1.216	1.223	1.230	1.244	1.258	1.273	1.280	1.287	1.301	1.315	1.336	1.351	1.358	1.388	1.421
20	20	1.165	1.172	1.178	1.185	1.192	1.199	1.205	1.212	1.219	1.232	1.246	1.259	1.266	1.272	1.286	1.299	1.320	1.333	1.340	1.367	1.400
21	21	1.157	1.163	1.170	1.176	1.183	1.189	1.195	1.202	1.208	1.221	1.234	1.247	1.253	1.259	1.273	1.285	1.304	1.317	1.324	1.349	1.381
22	22	1.150	1.156	1.162	1.168	1.174	1.180	1.187	1.193	1.199	1.211	1.223	1.235	1.242	1.248	1.260	1.272	1.291	1.303	1.309	1.333	1.364
23	23	1.143	1.149	1.155	1.161	1.167	1.173	1.178	1.184	1.190	1.202	1.214	1.225	1.231	1.237	1.249	1.260	1.278	1.290	1.295	1.319	1.348
24	24	1.137	1.143	1.149	1.154	1.160	1.165	1.171	1.177	1.182	1.193	1.205	1.216	1.221	1.227	1.238	1.249	1.266	1.277	1.283	1.306	1.334
25	25	1.132	1.137	1.143	1.148	1.153	1.159	1.164	1.170	1.175	1.186	1.198	1.207	1.213	1.218	1.229	1.239	1.256	1.266	1.272	1.293	1.320
26	26	1.127	1.132	1.137	1.143	1.148	1.153	1.158	1.163	1.168	1.179	1.189	1.199	1.204	1.210	1.220	1.230	1.246	1.256	1.261	1.282	1.308
27	27	1.122	1.127	1.132	1.137	1.142	1.147	1.152	1.157	1.162	1.172	1.182	1.192	1.197	1.202	1.212	1.222	1.237	1.247	1.252	1.272	1.298
28	28	1.118	1.123	1.127	1.132	1.137	1.142	1.147	1.151	1.156	1.166	1.175	1.185	1.190	1.195	1.204	1.214	1.228	1.238	1.243	1.263	1.288
29	29	1.114	1.118	1.123	1.128	1.132	1.137	1.142	1.146	1.151	1.160	1.169	1.179	1.183	1.188	1.197	1.208	1.220	1.230	1.234	1.253	1.278
30	30	1.110	1.114	1.119	1.123	1.128	1.132	1.137	1.141	1.146	1.155	1.164	1.173	1.177	1.182	1.191	1.200	1.213	1.222	1.226	1.244	1.267
31	31	1.106	1.111	1.115	1.119	1.124	1.128	1.132	1.137	1.141	1.150	1.158	1.167	1.171	1.176	1.184	1.193	1.208	1.215	1.219	1.236	1.258
32	32	1.103	1.107	1.111	1.116	1.120	1.124	1.128	1.132	1.137	1.145	1.153	1.162	1.166	1.170	1.179	1.187	1.200	1.208	1.212	1.229	1.250
33	33	1.100	1.104	1.108	1.112	1.116	1.120	1.124	1.128	1.133	1.141	1.149	1.157	1.161	1.165	1.173	1.181	1.194	1.202	1.206	1.222	1.243
34	34	1.097	1.101	1.105	1.109	1.113	1.117	1.121	1.125	1.129	1.137	1.144	1.152	1.156	1.160	1.168	1.178	1.188	1.198	1.200	1.216	1.235
35	35	1.094	1.098	1.102	1.106	1.110	1.113	1.117	1.121	1.125	1.133	1.140	1.148	1.152	1.156	1.163	1.171	1.183	1.190	1.194	1.210	1.229
36	36	1.092	1.095	1.099	1.103	1.107	1.110	1.114	1.118	1.122	1.129	1.136	1.144	1.147	1.151	1.159	1.166	1.178	1.185	1.189	1.204	1.222
37	37	1.089	1.093	1.098	1.100	1.103	1.107	1.111	1.115	1.118	1.126	1.133	1.140	1.144	1.147	1.155	1.162	1.173	1.180	1.184	1.198	1.216
38	38	1.087	1.090	1.094	1.097	1.101	1.104	1.108	1.112	1.115	1.122	1.129	1.136	1.140	1.143	1.150	1.158	1.168	1.175	1.179	1.193	1.211
39	39	1.085	1.088	1.091	1.095	1.098	1.102	1.105	1.109	1.112	1.119	1.126	1.133	1.136	1.140	1.147	1.154	1.164	1.171	1.174	1.188	1.205
40	40	1.082	1.086	1.089	1.093	1.096	1.099	1.103	1.106	1.109	1.116	1.123	1.129	1.133	1.136	1.143	1.150	1.160	1.166	1.170	1.183	1.200
42	42	1.079	1.082	1.085	1.088	1.091	1.095	1.098	1.101	1.104	1.111	1.117	1.123	1.127	1.130	1.138	1.143	1.152	1.159	1.162	1.175	1.191
44	44	1.075	1.078	1.081	1.084	1.087	1.090	1.093	1.096	1.099	1.106	1.112	1.118	1.121	1.124	1.130	1.136	1.145	1.151	1.154	1.167	1.182
46	46	1.072	1.075	1.078	1.080	1.083	1.086	1.089	1.092	1.095	1.101	1.107	1.113	1.116	1.118	1.124	1.130	1.139	1.145	1.148	1.159	1.174
48	48	1.069	1.072	1.074	1.077	1.080	1.083	1.086	1.088	1.091	1.097	1.102	1.108	1.111	1.114	1.119	1.125	1.133	1.139	1.142	1.153	1.167
50	50	1.066	1.069	1.071	1.074	1.077	1.079	1.082	1.085	1.088	1.093	1.098	1.104	1.106	1.109	1.114	1.120	1.128	1.133	1.136	1.147	1.160
52	52	1.063	1.066	1.068	1.071	1.074	1.078	1.081	1.084	1.087	1.092	1.098	1.104	1.106	1.109	1.114	1.120	1.128	1.133	1.136	1.147	1.160
54	54	1.061	1.064	1.066	1.069	1.071	1.074	1.078	1.081	1.084	1.089	1.095	1.101	1.103	1.106	1.111	1.118	1.123	1.128	1.131	1.141	1.154
56	56	1.059	1.061	1.064	1.066	1.069	1.071	1.073	1.078	1.083	1.088	1.092	1.098	1.099	1.102	1.107	1.114	1.119	1.121	1.121	1.131	1.143
58	58	1.057	1.059	1.062	1.064	1.066	1.068	1.071	1.073	1.075	1.080	1.085	1.089	1.091	1.094	1.099	1.103	1.110	1.115	1.117	1.126	1.138
60	60	1.055	1.057	1.059	1.062	1.064	1.066	1.068	1.071	1.073	1.077	1.082	1.086	1.088	1.091	1.095	1.100	1.107	1.111	1.113	1.122	1.133
63	63	1.052	1.055	1.057	1.059	1.061	1.063	1.065	1.067	1.069	1.074	1.078	1.082	1.084	1.086	1.091	1.095	1.101	1.106	1.108	1.118	1.127
66	66	1.050	1.052	1.054	1.056	1.058	1.060	1.062	1.064	1.066	1.070	1.074	1.078	1.081	1.083	1.087	1.091	1.097	1.101	1.103	1.111	1.121
68	68	1.048	1.050	1.052	1.054	1.056	1.058	1.060	1.061	1.063	1.067	1.071	1.075	1.077	1.079	1.083	1.087	1.093	1.097	1.098	1.106	1.116
72	72	1.046	1.048	1.050	1.051	1.053	1.055	1.057	1.059	1.061	1.065	1.068	1.072	1.074	1.076	1.079	1.083	1.089	1.093	1.094	1.102	1.111
75	75	1.044	1.046	1.048	1.049	1.051	1.053	1.055	1.057	1.059	1.063	1.065	1.069	1.071	1.073	1.076	1.078	1.085	1.089	1.091	1.098	1.107
78	78	1.042	1.044	1.046	1.047	1.049	1.051	1.053	1.054	1.056	1.060	1.063	1.066	1.068	1.070	1.073	1.077	1.082	1.085	1.087	1.094	1.103
81	81	1.041	1.042	1.044	1.046	1.047	1.049	1.051	1.052	1.054	1.057	1.061	1.064	1.066	1.067	1.071	1.074	1.079	1.082	1.084	1.091	1.099
84	84	1.039	1.041	1.042	1.044	1.046	1.047	1.049	1.051	1.052	1.055	1.058	1.062	1.063	1.065	1.068	1.071	1.076	1.079	1.081	1.087	1.095
15	15	.7845	.7880	.7937	.7979	.8024	.8061	.8095	.8127	.8157	.8185	.8211	.8236	.8260	.8283	.8305	.8326	.8346	.8365	.8383	.8400	.8416
16	16	.7509	.7528	.7567	.7605	.7642	.7678	.7712	.7745	.7776	.7806	.7834	.7860	.7885	.7909	.7932	.7954	.7975	.7995	.8014	.8032	.8049
17	17	.7385	.7398	.7435	.7471	.7506	.7540	.7572	.7603	.7633	.7661	.7687	.7712	.7736	.7759	.7781	.7802	.7822	.7841	.7859	.7876	.7892
18	18	.7273	.7282	.7317	.7351	.7384	.7416	.7446	.7475	.7503	.7530	.7556	.7581	.7605	.7628	.7650	.7671	.7691	.7710	.7728	.7745	.7761
19	19	.7171	.7177	.7209	.7240	.7270	.7298	.7325	.7351	.7376	.7401	.7425	.7448	.7470	.7491	.7512	.7532	.7551	.7569	.7586	.7603	.7618
20	20	.7078	.7082	.7111	.7140	.7168	.7194	.7219	.7243	.7266	.7289	.7311	.7332	.7353	.7373	.7392	.7411	.7429	.7446	.7463	.7479	.7494
21	21	.6992	.6994	.7021	.7047	.7071	.7094	.7116	.7138	.7159	.7179	.7198	.7216	.7234	.7251	.7268	.7284	.7299	.7314	.7329	.7343	.7357
22	22	.6914	.6914	.6939	.6962	.6983	.6999	.7014	.7029	.7043	.7057	.7070	.7083	.7095	.7107	.7119	.7130	.7141	.7151	.7161	.7171	.7180
23	23	.6841	.6841	.6863	.6884	.6903	.6919	.6934	.6948	.6961	.6974	.6986	.6997	.7008	.7019	.7029	.7039	.7049	.7058	.7067	.7076	.7084
24	24																					

TABLE 3.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.31$; $\frac{b_A}{t_W} = 16.3$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.69$; $\frac{p}{t_S} = 4.91$) - Concluded

$\frac{b_W}{t_S}$		10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	46
37		.6201	.6358	.6527	.6709	.6900	.7107	.7324	.7562	.7792	.8305	.8864	.9468	.9783	1.011	1.080	1.153	1.269	1.353	1.395	1.578	1.823
38		.6172	.6325	.6491	.6668	.6857	.7057	.7269	.7492	.7726	.8228	.8774	.9362	.9672	.9993	1.067	1.138	1.252	1.333	1.375	1.552	1.794
39		.6145	.6294	.6456	.6629	.6813	.7009	.7216	.7434	.7663	.8154	.8688	.9264	.9567	.9881	1.054	1.124	1.235	1.315	1.356	1.530	1.767
40		.6118	.6264	.6423	.6591	.6772	.6963	.7166	.7379	.7603	.8084	.8608	.9189	.9486	.9793	1.042	1.110	1.220	1.297	1.338	1.508	1.740
42		.6089	.6239	.6391	.6552	.6722	.6895	.7072	.7256	.7441	.7951	.8452	.8993	.9277	.9572	1.019	1.085	1.190	1.265	1.303	1.467	1.691
44		.6023	.6168	.6320	.6478	.6642	.6800	.6966	.7132	.7308	.7830	.8311	.8830	.9104	.9387	.9983	1.061	1.163	1.227	1.272	1.429	1.645
46		.5982	.6111	.6260	.6400	.6558	.6728	.6900	.7075	.7251	.7778	.8251	.8760	.9034	.9317	.9909	1.040	1.137	1.207	1.243	1.394	1.602
48		.5943	.6068	.6220	.6345	.6488	.6641	.6804	.6971	.7139	.7663	.8134	.8634	.8908	.9191	.9781	1.020	1.114	1.181	1.215	1.362	1.563
50		.5908	.6028	.6175	.6305	.6443	.6590	.6743	.6900	.7057	.7579	.8049	.8549	.8823	.9106	.9696	1.010	1.092	1.157	1.190	1.332	1.528
52		.5875	.5991	.6135	.6268	.6401	.6543	.6690	.6841	.6991	.7511	.7981	.8481	.8755	.9038	.9628	1.000	1.078	1.141	1.173	1.312	1.492
54		.5845	.5956	.6097	.6225	.6353	.6489	.6630	.6774	.6919	.7437	.7907	.8407	.8681	.8964	.9554	1.000	1.075	1.137	1.169	1.298	1.468
56		.5816	.5924	.6060	.6185	.6310	.6443	.6579	.6717	.6854	.7371	.7841	.8341	.8615	.8898	.9488	1.000	1.073	1.135	1.167	1.285	1.455
58		.5790	.5894	.6026	.6147	.6266	.6393	.6523	.6653	.6781	.7297	.7767	.8267	.8541	.8824	.9414	1.000	1.071	1.133	1.165	1.273	1.443
60		.5765	.5868	.5995	.6112	.6228	.6350	.6473	.6595	.6717	.7233	.7703	.8203	.8477	.8760	.9350	1.000	1.070	1.132	1.164	1.262	1.432
63		.5730	.5828	.5951	.6064	.6175	.6285	.6395	.6505	.6615	.7131	.7601	.8101	.8375	.8658	.9248	1.000	1.069	1.131	1.163	1.251	1.421
66		.5699	.5791	.5891	.5998	.6101	.6204	.6307	.6409	.6511	.7027	.7497	.7997	.8271	.8554	.9144	1.000	1.069	1.131	1.163	1.251	1.421
69		.5669	.5758	.5854	.5957	.6056	.6153	.6250	.6347	.6444	.6960	.7430	.7930	.8204	.8487	.9077	1.000	1.069	1.131	1.163	1.251	1.421
72		.5643	.5728	.5820	.5919	.6014	.6107	.6200	.6293	.6386	.6902	.7372	.7872	.8146	.8429	.9019	1.000	1.069	1.131	1.163	1.251	1.421
75		.5619	.5700	.5789	.5884	.5985	.6083	.6176	.6268	.6361	.6877	.7347	.7847	.8121	.8404	.8994	1.000	1.069	1.131	1.163	1.251	1.421
78		.5595	.5674	.5760	.5851	.5949	.6043	.6136	.6228	.6321	.6837	.7307	.7807	.8081	.8364	.8954	1.000	1.069	1.131	1.163	1.251	1.421
81		.5574	.5650	.5733	.5821	.5916	.6010	.6102	.6195	.6288	.6804	.7274	.7774	.8048	.8331	.8921	1.000	1.069	1.131	1.163	1.251	1.421
84		.5555	.5628	.5708	.5793	.5885	.5982	.6084	.6193	.6307	.6823	.7293	.7793	.8067	.8350	.8940	1.000	1.069	1.131	1.163	1.251	1.421
15		.7984	.8801	.9678	1.059	1.153	1.250	1.350	1.452	1.556	1.770	1.991	2.218	2.334	2.450	2.688	2.928	3.297	3.655	3.871	4.180	4.827
16		.7804	.8621	.9477	1.037	1.129	1.224	1.322	1.422	1.524	1.734	1.952	2.176	2.289	2.404	2.638	2.875	3.239	3.485	3.609	4.112	4.764
17		.7655	.8453	.9290	1.018	1.106	1.200	1.298	1.394	1.494	1.701	1.914	2.134	2.248	2.360	2.590	2.824	3.184	3.427	3.550	4.048	4.684
18		.7514	.8295	.9115	.9989	1.085	1.177	1.271	1.367	1.466	1.669	1.879	2.098	2.208	2.318	2.545	2.776	3.131	3.371	3.493	3.988	4.616
19		.7384	.8147	.8950	.9787	1.066	1.155	1.248	1.342	1.439	1.639	1.846	2.059	2.168	2.278	2.502	2.730	3.081	3.318	3.438	3.928	4.550
20		.7261	.8008	.8795	.9616	1.047	1.135	1.226	1.319	1.414	1.610	1.814	2.029	2.132	2.240	2.461	2.687	3.033	3.267	3.386	3.869	4.488
21		.7145	.7877	.8648	.9454	1.029	1.116	1.205	1.296	1.390	1.583	1.784	1.991	2.097	2.204	2.423	2.645	2.987	3.219	3.336	3.814	4.427
22		.7035	.7753	.8510	.9301	1.012	1.097	1.185	1.275	1.367	1.558	1.756	1.960	2.064	2.170	2.385	2.605	2.943	3.172	3.289	3.761	4.368
23		.6932	.7638	.8379	.9158	.9983	1.080	1.168	1.255	1.346	1.533	1.728	1.930	2.033	2.137	2.350	2.568	2.901	3.128	3.243	3.711	4.312
24		.6834	.7523	.8255	.9019	.9812	1.064	1.148	1.236	1.326	1.510	1.702	1.901	2.002	2.105	2.315	2.530	2.860	3.085	3.198	3.662	4.257
25		.6741	.7420	.8137	.8887	.9699	1.048	1.131	1.217	1.305	1.488	1.677	1.873	1.974	2.075	2.283	2.495	2.821	3.043	3.155	3.615	4.205
26		.6653	.7320	.8024	.8762	.9582	1.033	1.115	1.200	1.287	1.468	1.654	1.847	1.948	2.047	2.252	2.461	2.784	3.004	3.115	3.569	4.154
27		.6569	.7225	.7917	.8644	.9461	1.019	1.100	1.183	1.269	1.448	1.631	1.822	1.920	2.019	2.221	2.428	2.748	2.965	3.076	3.528	4.105
28		.6489	.7133	.7815	.8530	.9346	1.005	1.085	1.167	1.253	1.427	1.609	1.798	1.893	1.992	2.193	2.397	2.714	2.929	3.038	3.483	4.057
29		.6413	.7047	.7718	.8422	.9237	.9920	1.071	1.152	1.235	1.408	1.588	1.774	1.870	1.967	2.165	2.367	2.680	2.893	3.001	3.442	4.011
30		.6340	.6964	.7625	.8318	.9134	.9794	1.057	1.137	1.219	1.390	1.568	1.752	1.846	1.942	2.138	2.338	2.648	2.859	2.966	3.403	3.967
31		.6270	.6884	.7535	.8219	.8933	.9674	1.044	1.123	1.204	1.373	1.548	1.730	1.824	1.919	2.112	2.310	2.617	2.828	2.932	3.365	3.924
32		.6203	.6808	.7449	.8124	.8828	.9569	1.032	1.110	1.190	1.358	1.530	1.710	1.802	1.896	2.087	2.284	2.587	2.794	2.899	3.328	3.882
33		.6139	.6735	.7367	.8032	.8728	.9468	1.020	1.097	1.176	1.340	1.512	1.690	1.781	1.874	2.063	2.258	2.558	2.763	2.867	3.292	3.842
34		.6078	.6665	.7288	.7943	.8629	.9362	1.008	1.084	1.162	1.325	1.494	1.671	1.761	1.853	2.040	2.232	2.530	2.733	2.836	3.257	3.802
35		.6019	.6597	.7212	.7859	.8536	.9269	.9988	1.072	1.149	1.310	1.478	1.652	1.741	1.832	2.018	2.208	2.503	2.704	2.806	3.224	3.764
36		.5953	.6533	.7139	.7778	.8448	.9181	.9890	1.060	1.137	1.298	1.462	1.634	1.723	1.812	2.000	2.185	2.478	2.678	2.777	3.191	3.727
37		.5908	.6470	.7069	.7699	.8360	.9094	.9797	1.049	1.125	1.282	1.446	1.616	1.704	1.793	1.975	2.152	2.441	2.641	2.740	3.159	3.691
38		.5855	.6410	.7001	.7623	.8275	.8953	.9658	1.038	1.113	1.268	1.431	1.600	1.688	1.774	1.955	2.140	2.426	2.622	2.721	3.128	3.656
39		.5805	.6353	.6935	.7550	.8194	.8864	.9559	1.028	1.102	1.255	1.416	1.583	1.669	1.755	1.935	2.118	2.402	2.598	2.695	3.099	3.622
40		.5756	.6297	.6872	.7479	.8118	.8779	.9466	1.018	1.091	1.243	1.402	1.568	1.653	1.739	1.918	2.098	2.379	2.572	2.669	3.070	3.589
42		.5684	.6190	.6752	.7345	.7967	.8615	.9288	.9982	1.070	1.219	1.375	1.537	1.621	1.706	1.879	2.058	2.335	2.524	2.620	3.014	3.525
44		.5677	.6091	.6639	.7219	.7827	.8461	.9120	.9801	1.050	1.198	1.350	1.509	1.591	1.674	1.845	2.020	2.292	2.474	2.573	2.961	3.465
46		.5497	.5998	.6534	.7101	.7696	.8318	.8982	.9630	1.032	1.175	1.326	1.483	1.563	1.644	1.812	1.985	2.253	2.435	2.529	2.911	3.407
48		.5420	.5911	.6435	.6990	.7566	.8181	.8813	.9468	1.014	1.155	1.303	1.457	1.536	1.616	1.781	1.951	2.215	2.395	2.487	2.863	3.353
50		.5348	.5828	.6341	.6885	.7456	.8053	.8673	.9318	.9979	1.138	1.281	1.432	1.511	1.590	1.752	1.919	2.179	2.358	2.447	2.818	3.300
52		.5281	.5753	.6253	.6786	.7345	.7931	.8540	.9171	.9823	1.118	1.261	1.410	1.488	1.564	1.724	1.889	2.144	2.319	2.408	2.774	3.251
54		.5217	.5677	.6169	.6691	.7241	.7816	.8414	.9034	.9674	1.101	1.241	1.388	1.463	1.540	1.698	1.860	2.111	2.284	2.372	2.733	3.203
56																						

TABLE 4.- Z-PANEL PROPERTIES ($\frac{b_W}{t_S} = 0.40$; $\frac{b_A}{t_W} = 12.8$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.68$; $\frac{p}{t_S} = 4.90$)

$\frac{b_W}{t_W}$	$\frac{b_S}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
15		1.285	1.300	1.315	1.330	1.345	1.360	1.374	1.389	1.404	1.434	1.464	1.494	1.509	1.524	1.554	1.583	1.628	1.658	1.673	1.733	1.807
16		1.287	1.281	1.295	1.309	1.323	1.337	1.351	1.365	1.379	1.407	1.435	1.463	1.477	1.491	1.519	1.547	1.589	1.617	1.631	1.697	1.757
17		1.251	1.265	1.278	1.291	1.304	1.317	1.330	1.344	1.357	1.383	1.409	1.436	1.449	1.462	1.488	1.515	1.564	1.591	1.604	1.671	1.712
18		1.237	1.250	1.262	1.275	1.287	1.300	1.312	1.324	1.337	1.362	1.387	1.412	1.424	1.438	1.461	1.486	1.524	1.548	1.561	1.611	1.673
19		1.225	1.237	1.248	1.260	1.272	1.284	1.296	1.307	1.319	1.343	1.368	1.390	1.402	1.413	1.437	1.461	1.496	1.520	1.531	1.579	1.637
20		1.214	1.225	1.236	1.247	1.258	1.270	1.281	1.292	1.303	1.326	1.348	1.370	1.382	1.393	1.415	1.438	1.471	1.494	1.505	1.550	1.608
21		1.203	1.214	1.225	1.235	1.246	1.257	1.267	1.278	1.289	1.310	1.331	1.353	1.363	1.374	1.395	1.417	1.449	1.470	1.481	1.523	1.577
22		1.194	1.204	1.215	1.225	1.235	1.245	1.255	1.266	1.276	1.298	1.318	1.337	1.347	1.357	1.377	1.398	1.428	1.449	1.459	1.500	1.551
23		1.186	1.196	1.205	1.215	1.225	1.234	1.244	1.254	1.264	1.283	1.303	1.322	1.332	1.342	1.361	1.381	1.410	1.429	1.439	1.478	1.527
24		1.178	1.187	1.197	1.206	1.215	1.225	1.234	1.243	1.253	1.271	1.290	1.309	1.318	1.327	1.346	1.365	1.393	1.411	1.421	1.458	1.505
25		1.171	1.180	1.189	1.198	1.207	1.216	1.225	1.234	1.243	1.261	1.278	1.296	1.305	1.314	1.332	1.350	1.377	1.395	1.404	1.440	1.484
26		1.164	1.173	1.182	1.190	1.199	1.207	1.216	1.225	1.233	1.251	1.268	1.285	1.294	1.302	1.319	1.337	1.363	1.380	1.388	1.423	1.466
27		1.158	1.167	1.175	1.183	1.191	1.200	1.208	1.216	1.225	1.241	1.258	1.274	1.283	1.291	1.308	1.324	1.349	1.366	1.374	1.407	1.449
28		1.153	1.161	1.169	1.177	1.185	1.193	1.201	1.209	1.217	1.233	1.249	1.265	1.273	1.281	1.297	1.313	1.337	1.353	1.361	1.393	1.433
29		1.147	1.155	1.163	1.171	1.178	1.186	1.194	1.201	1.209	1.225	1.240	1.256	1.263	1.271	1.286	1.302	1.325	1.340	1.348	1.379	1.418
30		1.142	1.150	1.157	1.165	1.172	1.180	1.187	1.195	1.202	1.217	1.232	1.247	1.254	1.262	1.277	1.292	1.314	1.329	1.337	1.368	1.404
31		1.138	1.145	1.152	1.160	1.167	1.174	1.181	1.188	1.195	1.210	1.225	1.239	1.246	1.253	1.268	1.282	1.304	1.318	1.326	1.356	1.391
32		1.134	1.141	1.148	1.155	1.162	1.169	1.176	1.183	1.190	1.204	1.218	1.232	1.239	1.246	1.260	1.274	1.295	1.309	1.316	1.344	1.379
33		1.130	1.136	1.143	1.150	1.157	1.163	1.170	1.177	1.184	1.197	1.211	1.225	1.231	1.238	1.252	1.265	1.286	1.299	1.306	1.333	1.367
34		1.126	1.132	1.139	1.145	1.152	1.159	1.165	1.172	1.178	1.192	1.205	1.218	1.224	1.231	1.244	1.257	1.277	1.290	1.297	1.323	1.356
35		1.122	1.129	1.135	1.141	1.146	1.154	1.161	1.167	1.173	1.186	1.199	1.212	1.218	1.224	1.237	1.250	1.269	1.282	1.288	1.314	1.346
36		1.119	1.125	1.131	1.137	1.144	1.150	1.156	1.162	1.168	1.181	1.193	1.206	1.212	1.218	1.231	1.243	1.262	1.274	1.280	1.305	1.336
37		1.116	1.122	1.128	1.134	1.140	1.146	1.152	1.158	1.164	1.178	1.188	1.200	1.206	1.212	1.224	1.237	1.255	1.267	1.273	1.297	1.327
38		1.112	1.118	1.124	1.130	1.136	1.142	1.148	1.154	1.160	1.171	1.183	1.195	1.201	1.207	1.219	1.230	1.248	1.260	1.266	1.289	1.319
39		1.110	1.115	1.121	1.127	1.133	1.138	1.144	1.150	1.156	1.167	1.179	1.190	1.196	1.201	1.213	1.224	1.242	1.253	1.259	1.282	1.311
40		1.107	1.112	1.118	1.124	1.129	1.135	1.140	1.146	1.152	1.163	1.174	1.185	1.191	1.196	1.208	1.219	1.236	1.247	1.252	1.275	1.303
42		1.102	1.107	1.112	1.118	1.123	1.128	1.134	1.139	1.144	1.155	1.166	1.176	1.182	1.187	1.198	1.208	1.224	1.235	1.240	1.262	1.288
44		1.097	1.102	1.107	1.112	1.118	1.123	1.128	1.133	1.138	1.148	1.158	1.168	1.173	1.179	1.189	1.199	1.214	1.224	1.229	1.250	1.275
46		1.093	1.098	1.103	1.108	1.112	1.117	1.122	1.127	1.132	1.142	1.151	1.161	1.166	1.171	1.181	1.190	1.205	1.215	1.219	1.239	1.263
48		1.089	1.094	1.098	1.103	1.108	1.112	1.117	1.122	1.126	1.136	1.145	1.154	1.159	1.164	1.173	1.182	1.196	1.206	1.210	1.229	1.252
50		1.085	1.090	1.094	1.099	1.103	1.108	1.112	1.117	1.121	1.130	1.139	1.148	1.153	1.157	1.166	1.175	1.188	1.197	1.202	1.220	1.242
52		1.082	1.087	1.091	1.095	1.099	1.104	1.108	1.112	1.117	1.125	1.134	1.143	1.148	1.152	1.160	1.168	1.181	1.190	1.194	1.211	1.233
54		1.079	1.083	1.087	1.092	1.096	1.100	1.104	1.108	1.112	1.121	1.129	1.137	1.141	1.145	1.154	1.162	1.175	1.183	1.187	1.204	1.224
56		1.076	1.080	1.084	1.088	1.092	1.096	1.100	1.104	1.108	1.116	1.124	1.132	1.136	1.140	1.148	1.156	1.168	1.176	1.180	1.196	1.216
58		1.074	1.078	1.081	1.085	1.089	1.093	1.097	1.101	1.105	1.112	1.120	1.128	1.133	1.135	1.143	1.151	1.162	1.170	1.174	1.190	1.209
60		1.071	1.075	1.078	1.082	1.086	1.090	1.094	1.097	1.101	1.109	1.116	1.124	1.127	1.131	1.138	1.146	1.157	1.165	1.169	1.183	1.202
63		1.068	1.071	1.075	1.079	1.082	1.086	1.089	1.093	1.096	1.103	1.111	1.118	1.121	1.125	1.132	1.139	1.150	1.157	1.160	1.174	1.192
66		1.065	1.068	1.072	1.075	1.078	1.082	1.085	1.089	1.092	1.099	1.106	1.112	1.116	1.119	1.126	1.133	1.143	1.150	1.153	1.167	1.184
69		1.062	1.065	1.068	1.072	1.075	1.078	1.081	1.085	1.088	1.094	1.101	1.107	1.111	1.114	1.120	1.127	1.137	1.143	1.146	1.159	1.178
72		1.059	1.062	1.066	1.069	1.072	1.075	1.078	1.081	1.084	1.090	1.097	1.103	1.108	1.109	1.115	1.122	1.131	1.137	1.140	1.153	1.168
75		1.057	1.060	1.063	1.066	1.069	1.072	1.075	1.078	1.081	1.087	1.093	1.099	1.103	1.105	1.111	1.117	1.126	1.132	1.135	1.147	1.161
78		1.055	1.058	1.061	1.063	1.066	1.069	1.072	1.075	1.078	1.087	1.089	1.095	1.098	1.101	1.108	1.112	1.121	1.127	1.129	1.141	1.155
81		1.053	1.056	1.058	1.061	1.064	1.067	1.070	1.072	1.075	1.080	1.086	1.092	1.094	1.097	1.103	1.108	1.116	1.122	1.125	1.138	1.150
84		1.051	1.054	1.056	1.059	1.062	1.064	1.067	1.070	1.072	1.078	1.083	1.088	1.091	1.094	1.099	1.104	1.112	1.118	1.120	1.131	1.144
15	$\frac{h}{t_S}$	.9541	1.019	1.068	1.162	1.239	1.321	1.406	1.495	1.588	1.783	1.991	2.212	2.327	2.444	2.687	2.940	3.338	3.615	3.756	4.342	5.115
16		.9317	.9936	1.060	1.130	1.204	1.282	1.364	1.449	1.538	1.726	1.928	2.139	2.249	2.363	2.597	2.842	3.227	3.494	3.631	4.199	4.951
17		.9114	.9708	1.034	1.101	1.172	1.247	1.326	1.406	1.493	1.674	1.867	2.072	2.178	2.288	2.514	2.761	3.124	3.383	3.516	4.087	4.798
18		.8929	.9497	1.011	1.075	1.143	1.215	1.291	1.370	1.452	1.626	1.812	2.010	2.113	2.219	2.438	2.687	3.028	3.280	3.409	3.944	4.655
19		.8761	.9306	.9890	1.051	1.117	1.186	1.259	1.335	1.414	1.582	1.762	1.953	2.052	2.155	2.337	2.589	2.939	3.183	3.309	3.829	4.522
20		.8605	.9130	.9692	1.029	1.092	1.159	1.229	1.302	1.379	1.541	1.715	1.900	1.996	2.095	2.301	2.516	2.858	3.093	3.215	3.722	4.398
21		.8463	.8983	.9509	1.009	1.070	1.134	1.202	1.273	1.346	1.503	1.671	1.850	1.944	2.040	2.239	2.448	2.779	3.009	3.128	3.621	4.279
22		.8331	.8818	.9341	.9898	1.049	1.111	1.176	1.245	1.316	1.468	1.630	1.805	1.895	1.988	2.182	2.385	2.703	2.931	3.048	3.527	4.168
23		.8209	.8679	.9184	.9722	1.029	1.089	1.153	1.219	1.288	1.435	1.593	1.762	1.847	1.940	2.128	2.326	2.638	2.857	2.989	3.438	4.0

TABLE 4.- Z-PANEL PROPERTIES $\left(\frac{t_W}{t_S} = 0.40; \frac{b_A}{t_W} = 12.8; \frac{b_F}{b_W} = 0.4; \frac{d}{t_S} = 1.68; \frac{p}{t_S} = 4.90 \right)$ - Concluded

$\frac{b_W}{t_S}$	$\frac{t_W}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
37		.7120	.7438	.7780	.8148	.8535	.8948	.9383	.9843	1.032	1.134	1.245	1.384	1.428	1.491	1.625	1.767	1.993	2.153	2.235	2.581	3.048
38		.7070	.7381	.7715	.8073	.8453	.8858	.9282	.9729	1.020	1.120	1.228	1.345	1.406	1.469	1.601	1.740	1.963	2.118	2.199	2.538	2.997
39		.7022	.7326	.7653	.8003	.8375	.8769	.9188	.9624	1.008	1.106	1.213	1.327	1.387	1.448	1.578	1.714	1.932	2.085	2.164	2.497	2.948
40		.6977	.7274	.7594	.7936	.8300	.8687	.9094	.9523	.9973	1.093	1.197	1.309	1.368	1.429	1.555	1.692	1.903	2.053	2.131	2.458	2.901
42		.6891	.7178	.7483	.7811	.8160	.8531	.8922	.9334	.9766	1.069	1.169	1.278	1.333	1.391	1.513	1.642	1.848	1.993	2.069	2.384	2.812
44		.6813	.7088	.7380	.7698	.8032	.8388	.8765	.9161	.9576	1.048	1.143	1.246	1.301	1.357	1.475	1.599	1.798	1.938	2.011	2.316	2.730
46		.6740	.7004	.7287	.7590	.7913	.8258	.8618	.8999	.9400	1.026	1.118	1.218	1.271	1.325	1.439	1.559	1.751	1.887	1.957	2.252	2.653
48		.6674	.6927	.7200	.7492	.7804	.8135	.8483	.8851	.9237	1.006	1.098	1.192	1.243	1.296	1.405	1.521	1.707	1.839	1.907	2.193	2.581
50		.6613	.6857	.7120	.7402	.7702	.8021	.8358	.8713	.9088	.9884	1.075	1.168	1.217	1.268	1.374	1.487	1.667	1.794	1.860	2.137	2.514
52		.6554	.6780	.7045	.7317	.7603	.7918	.8242	.8585	.8945	.9717	1.055	1.146	1.193	1.242	1.345	1.454	1.629	1.752	1.818	2.085	2.452
54		.6502	.6722	.6975	.7238	.7520	.7817	.8133	.8465	.8814	.9581	1.037	1.125	1.171	1.218	1.318	1.424	1.593	1.713	1.775	2.038	2.393
56		.6452	.6672	.6910	.7165	.7437	.7728	.8031	.8353	.8691	.9415	1.020	1.105	1.150	1.196	1.293	1.395	1.600	1.678	1.738	1.991	2.337
58		.6406	.6626	.6849	.7097	.7360	.7640	.7936	.8248	.8575	.9278	1.004	1.087	1.130	1.175	1.269	1.368	1.628	1.641	1.700	1.947	2.285
60		.6362	.6582	.6792	.7032	.7288	.7559	.7846	.8150	.8467	.9150	.9891	1.069	1.111	1.155	1.248	1.343	1.499	1.609	1.666	1.907	2.235
63		.6301	.6519	.6713	.6942	.7187	.7447	.7722	.8012	.8318	.8970	.9681	1.045	1.085	1.127	1.215	1.308	1.457	1.563	1.618	1.850	2.168
65		.6245	.6455	.6640	.6860	.7095	.7344	.7608	.7886	.8179	.8808	.9488	1.023	1.061	1.102	1.188	1.275	1.419	1.521	1.574	1.797	2.102
69		.6184	.6376	.6553	.6784	.7010	.7250	.7503	.7771	.8052	.8655	.9311	1.002	1.039	1.078	1.159	1.246	1.384	1.482	1.533	1.748	2.043
72		.6148	.6323	.6512	.6715	.6932	.7162	.7406	.7664	.7935	.8516	.9147	.9830	1.019	1.057	1.135	1.218	1.351	1.448	1.495	1.703	1.988
76		.6104	.6273	.6455	.6651	.6860	.7082	.7317	.7565	.7826	.8388	.8995	.9655	1.000	1.036	1.112	1.192	1.321	1.413	1.460	1.661	1.936
78		.6063	.6227	.6402	.6591	.6792	.7007	.7234	.7473	.7725	.8240	.8855	.9491	.9828	1.018	1.091	1.168	1.293	1.382	1.428	1.622	1.899
81		.6026	.6183	.6353	.6536	.6730	.6937	.7157	.7388	.7631	.8154	.8739	.9339	.9686	1.000	1.071	1.146	1.267	1.353	1.397	1.586	1.844
84		.5991	.6143	.6307	.6483	.6672	.6872	.7084	.7303	.7543	.8049	.8600	.9197	.9512	.9838	1.052	1.125	1.242	1.325	1.368	1.551	1.802
15		1.164	1.297	1.435	1.577	1.723	1.871	2.022	2.175	2.331	2.648	2.971	3.300	3.468	3.633	3.970	4.310	4.825	5.170	5.344	6.040	6.914
16		1.141	1.272	1.407	1.547	1.690	1.838	1.984	2.138	2.289	2.603	2.922	3.248	3.412	3.578	3.912	4.250	4.765	5.105	5.277	5.971	6.844
17		1.119	1.248	1.381	1.518	1.659	1.803	1.949	2.098	2.250	2.559	2.875	3.197	3.360	3.525	3.858	4.191	4.700	5.041	5.213	5.904	6.774
18		1.099	1.225	1.358	1.491	1.629	1.771	1.916	2.063	2.212	2.518	2.830	3.149	3.311	3.473	3.802	4.135	4.639	4.979	5.150	5.838	6.705
19		1.079	1.204	1.332	1.465	1.601	1.741	1.884	2.029	2.178	2.478	2.787	3.103	3.263	3.424	3.750	4.080	4.581	4.919	5.089	5.773	6.637
20		1.061	1.182	1.310	1.441	1.575	1.713	1.853	1.998	2.142	2.440	2.746	3.058	3.217	3.378	3.700	4.027	4.525	4.860	5.029	5.710	6.571
21		1.044	1.164	1.289	1.417	1.550	1.685	1.824	1.965	2.109	2.404	2.705	3.016	3.173	3.331	3.651	3.978	4.470	4.803	4.971	5.648	6.505
22		1.027	1.146	1.268	1.395	1.526	1.659	1.796	1.938	2.078	2.369	2.668	2.974	3.130	3.287	3.604	3.928	4.418	4.747	4.914	5.588	6.441
23		1.012	1.128	1.249	1.374	1.503	1.635	1.770	1.908	2.048	2.336	2.632	2.935	3.090	3.244	3.559	3.878	4.365	4.694	4.859	5.529	6.378
24		.9968	1.111	1.231	1.354	1.481	1.611	1.744	1.881	2.019	2.304	2.597	2.897	3.049	3.203	3.515	3.832	4.315	4.641	4.808	5.471	6.316
25		.9828	1.096	1.213	1.335	1.460	1.588	1.720	1.855	1.992	2.273	2.563	2.860	3.011	3.163	3.472	3.787	4.268	4.590	4.754	5.414	6.256
26		.9691	1.083	1.198	1.318	1.440	1.567	1.697	1.830	1.965	2.244	2.530	2.824	2.974	3.125	3.431	3.743	4.219	4.541	4.703	5.361	6.197
27		.9562	1.068	1.180	1.298	1.421	1.546	1.674	1.806	1.940	2.215	2.499	2.790	2.938	3.088	3.392	3.701	4.173	4.493	4.654	5.308	6.139
28		.9438	1.052	1.164	1.281	1.402	1.526	1.653	1.783	1.915	2.187	2.469	2.757	2.904	3.052	3.353	3.660	4.129	4.448	4.608	5.256	6.083
29		.9320	1.039	1.150	1.265	1.384	1.507	1.632	1.761	1.892	2.161	2.439	2.725	2.871	3.018	3.318	3.620	4.085	4.401	4.560	5.205	6.028
30		.9206	1.026	1.136	1.250	1.367	1.488	1.612	1.739	1.869	2.136	2.411	2.694	2.838	2.984	3.280	3.582	4.044	4.357	4.515	5.156	5.974
31		.9097	1.014	1.122	1.235	1.351	1.470	1.593	1.719	1.847	2.111	2.384	2.664	2.807	2.952	3.245	3.545	4.003	4.314	4.471	5.108	5.921
32		.8991	1.002	1.109	1.220	1.335	1.453	1.575	1.699	1.828	2.087	2.357	2.635	2.777	2.920	3.212	3.508	3.963	4.272	4.428	5.061	5.870
33		.8891	.9904	1.098	1.208	1.320	1.437	1.557	1.680	1.806	2.064	2.332	2.607	2.748	2.890	3.179	3.473	3.924	4.231	4.386	5.015	5.820
34		.8795	.9794	1.084	1.193	1.305	1.421	1.540	1.661	1.788	2.042	2.307	2.580	2.719	2.860	3.147	3.439	3.887	4.192	4.346	4.971	5.771
35		.8701	.9699	1.072	1.180	1.291	1.405	1.523	1.643	1.767	2.020	2.283	2.554	2.692	2.831	3.118	3.408	3.851	4.153	4.308	4.927	5.723
36		.8611	.9607	1.061	1.167	1.277	1.390	1.507	1.628	1.748	1.999	2.259	2.528	2.665	2.804	3.086	3.374	3.815	4.116	4.271	4.885	5.678
37		.8524	.9519	1.050	1.155	1.264	1.378	1.491	1.609	1.730	1.979	2.237	2.503	2.639	2.777	3.058	3.343	3.781	4.079	4.230	4.843	5.630
38		.8439	.9434	1.039	1.143	1.251	1.362	1.478	1.593	1.713	1.960	2.215	2.479	2.614	2.750	3.028	3.311	3.747	4.043	4.192	4.803	5.585
39		.8358	.9352	1.029	1.132	1.239	1.348	1.461	1.577	1.696	1.941	2.194	2.458	2.593	2.725	3.000	3.282	3.714	4.009	4.157	4.763	5.541
40		.8279	.9271	1.019	1.201	1.228	1.335	1.447	1.562	1.680	1.922	2.174	2.433	2.565	2.700	2.973	3.253	3.682	3.974	4.122	4.725	5.498
42		.8130	.9104	1.000	1.100	1.203	1.310	1.420	1.533	1.648	1.887	2.134	2.389	2.520	2.652	2.921	3.197	3.620	3.909	4.055	4.650	5.414
44		.7989	.8984	.9823	1.080	1.182	1.287	1.394	1.505	1.619	1.853	2.098	2.348	2.478	2.607	2.872	3.144	3.562	3.848	3.991	4.578	5.335
46		.7853	.8834	.9655	1.062	1.161	1.264	1.370	1.479	1.591	1.821	2.061	2.308	2.435	2.563	2.825	3.093	3.505	3.787	3.929	4.510	5.253
48		.7733	.8693	.9498	1.044	1.142	1.243	1.347	1.454	1.564	1.791	2.027	2.271	2.396	2.522	2.780	3.045	3.452	3.730	3.871	4.445	5.184
50		.7615	.8559	.9346	1.027	1.123	1.223	1.325	1.431	1.539	1.762	1.995	2.235	2.358	2.483	2.738	2.999	3.401	3.675	3.814	4.382	5.114
52		.7504	.8432	.9204	1.011	1.108	1.204	1.305	1.409	1.515	1.735	1.964	2.201	2.323	2.446	2.697	2.955	3.352	3.623	3.760	4.322	5.046

TABLE 5.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.51$; $\frac{b_A}{t_W} = 11.0$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.77$; $\frac{p}{t_S} = 5.50$)

$\frac{b_W}{t_S}$	$\frac{b_W}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
15	1.463	1.487	1.512	1.536	1.560	1.584	1.609	1.633	1.657	1.706	1.754	1.802	1.827	1.851	1.900	1.949	2.021	2.070	2.094	2.181	2.313	
16	1.434	1.457	1.480	1.502	1.525	1.548	1.571	1.593	1.616	1.682	1.707	1.775	1.798	1.844	1.890	1.957	2.003	2.028	2.117	2.231		
17	1.409	1.430	1.451	1.473	1.494	1.516	1.537	1.558	1.580	1.623	1.668	1.703	1.730	1.751	1.794	1.837	1.901	1.944	1.965	2.051	2.158	
18	1.386	1.406	1.426	1.447	1.467	1.487	1.507	1.527	1.548	1.588	1.629	1.669	1.689	1.709	1.750	1.790	1.851	1.892	1.912	1.993	2.094	
19	1.368	1.385	1.404	1.423	1.442	1.461	1.481	1.500	1.519	1.557	1.595	1.634	1.653	1.672	1.710	1.749	1.806	1.845	1.864	1.941	2.036	
20	1.347	1.365	1.384	1.402	1.420	1.438	1.456	1.475	1.493	1.529	1.568	1.602	1.620	1.639	1.675	1.711	1.768	1.802	1.821	1.893	1.984	
21	1.331	1.348	1.365	1.383	1.400	1.417	1.435	1.452	1.469	1.504	1.539	1.573	1.591	1.608	1.643	1.678	1.730	1.764	1.782	1.851	1.938	
22	1.316	1.332	1.349	1.365	1.382	1.398	1.415	1.431	1.448	1.481	1.514	1.547	1.564	1.581	1.614	1.647	1.698	1.730	1.748	1.812	1.895	
23	1.303	1.318	1.334	1.350	1.365	1.381	1.397	1.413	1.429	1.460	1.492	1.524	1.539	1.555	1.587	1.619	1.668	1.698	1.714	1.773	1.856	
24	1.289	1.305	1.320	1.335	1.350	1.365	1.380	1.395	1.411	1.441	1.471	1.502	1.517	1.532	1.563	1.593	1.638	1.669	1.684	1.745	1.820	
25	1.278	1.292	1.306	1.321	1.336	1.351	1.365	1.379	1.394	1.423	1.453	1.481	1.496	1.511	1.540	1.569	1.613	1.642	1.658	1.715	1.788	
26	1.267	1.281	1.295	1.309	1.323	1.337	1.351	1.365	1.379	1.407	1.435	1.463	1.477	1.491	1.519	1.547	1.589	1.617	1.631	1.687	1.757	
27	1.257	1.271	1.284	1.298	1.311	1.325	1.338	1.352	1.365	1.392	1.419	1.446	1.460	1.473	1.500	1.527	1.567	1.594	1.608	1.662	1.729	
28	1.248	1.261	1.274	1.287	1.300	1.313	1.326	1.339	1.352	1.378	1.404	1.430	1.443	1.456	1.482	1.508	1.547	1.573	1.586	1.638	1.703	
29	1.239	1.252	1.265	1.277	1.290	1.302	1.315	1.327	1.340	1.365	1.390	1.415	1.428	1.440	1.466	1.491	1.528	1.553	1.566	1.616	1.679	
30	1.231	1.244	1.256	1.270	1.280	1.292	1.304	1.316	1.329	1.353	1.377	1.401	1.414	1.426	1.450	1.474	1.511	1.535	1.547	1.598	1.666	
31	1.224	1.236	1.248	1.259	1.271	1.283	1.295	1.306	1.318	1.341	1.365	1.388	1.400	1.412	1.435	1.459	1.494	1.518	1.529	1.578	1.636	
32	1.217	1.228	1.240	1.251	1.263	1.274	1.285	1.297	1.308	1.331	1.354	1.376	1.388	1.399	1.422	1.445	1.479	1.502	1.513	1.561	1.615	
33	1.210	1.221	1.233	1.244	1.255	1.266	1.277	1.288	1.299	1.321	1.343	1.365	1.376	1.387	1.409	1.431	1.464	1.486	1.497	1.542	1.597	
34	1.204	1.215	1.226	1.236	1.247	1.258	1.269	1.279	1.290	1.311	1.333	1.354	1.365	1.376	1.397	1.418	1.451	1.472	1.483	1.526	1.579	
35	1.198	1.209	1.219	1.230	1.240	1.250	1.261	1.271	1.282	1.302	1.323	1.344	1.354	1.365	1.386	1.408	1.438	1.459	1.469	1.511	1.563	
36	1.193	1.203	1.213	1.223	1.233	1.243	1.254	1.264	1.274	1.294	1.314	1.335	1.345	1.355	1.375	1.395	1.426	1.446	1.456	1.496	1.547	
37	1.188	1.198	1.207	1.217	1.227	1.237	1.247	1.257	1.268	1.288	1.308	1.325	1.335	1.345	1.365	1.385	1.414	1.434	1.444	1.483	1.532	
38	1.183	1.192	1.202	1.212	1.221	1.231	1.240	1.250	1.259	1.278	1.298	1.317	1.327	1.336	1.355	1.374	1.403	1.422	1.432	1.470	1.518	
39	1.178	1.187	1.197	1.206	1.215	1.225	1.234	1.243	1.253	1.271	1.290	1.307	1.318	1.327	1.346	1.365	1.393	1.412	1.421	1.458	1.505	
40	1.174	1.183	1.192	1.201	1.210	1.219	1.228	1.237	1.246	1.265	1.283	1.301	1.310	1.319	1.338	1.356	1.383	1.401	1.410	1.447	1.492	
42	1.165	1.174	1.183	1.191	1.200	1.209	1.217	1.226	1.235	1.253	1.269	1.287	1.295	1.304	1.321	1.339	1.365	1.382	1.391	1.425	1.469	
44	1.158	1.166	1.174	1.183	1.191	1.199	1.207	1.216	1.224	1.241	1.257	1.274	1.282	1.290	1.307	1.323	1.348	1.365	1.373	1.406	1.447	
46	1.151	1.158	1.167	1.175	1.183	1.191	1.198	1.206	1.214	1.230	1.246	1.262	1.270	1.278	1.293	1.309	1.333	1.349	1.357	1.389	1.428	
48	1.145	1.152	1.160	1.167	1.175	1.183	1.190	1.198	1.205	1.221	1.236	1.251	1.258	1.266	1.281	1.296	1.319	1.334	1.342	1.372	1.410	
50	1.139	1.146	1.154	1.161	1.168	1.175	1.183	1.190	1.197	1.212	1.226	1.241	1.248	1.255	1.270	1.286	1.306	1.321	1.328	1.357	1.394	
52	1.134	1.141	1.148	1.155	1.162	1.169	1.176	1.183	1.190	1.204	1.218	1.232	1.239	1.246	1.260	1.274	1.295	1.309	1.316	1.344	1.379	
54	1.129	1.135	1.142	1.149	1.156	1.162	1.169	1.176	1.183	1.198	1.210	1.225	1.230	1.237	1.250	1.263	1.284	1.297	1.304	1.331	1.365	
56	1.124	1.131	1.137	1.144	1.150	1.157	1.163	1.170	1.178	1.189	1.202	1.215	1.222	1.228	1.241	1.254	1.274	1.287	1.293	1.320	1.352	
58	1.120	1.126	1.132	1.139	1.145	1.151	1.157	1.164	1.170	1.183	1.195	1.208	1.214	1.220	1.233	1.245	1.264	1.277	1.283	1.308	1.339	
60	1.116	1.122	1.128	1.134	1.140	1.146	1.152	1.158	1.164	1.176	1.189	1.201	1.207	1.213	1.225	1.237	1.255	1.267	1.274	1.298	1.328	
63	1.110	1.116	1.122	1.128	1.133	1.139	1.145	1.151	1.156	1.168	1.180	1.191	1.197	1.203	1.214	1.226	1.243	1.255	1.261	1.284	1.313	
66	1.105	1.111	1.116	1.121	1.127	1.133	1.138	1.144	1.149	1.160	1.171	1.182	1.188	1.194	1.206	1.218	1.232	1.243	1.249	1.271	1.298	
69	1.101	1.106	1.111	1.116	1.122	1.127	1.132	1.138	1.143	1.153	1.164	1.175	1.180	1.185	1.196	1.208	1.222	1.233	1.240	1.259	1.285	
72	1.096	1.102	1.107	1.112	1.117	1.122	1.127	1.132	1.137	1.147	1.157	1.167	1.172	1.177	1.187	1.198	1.213	1.223	1.228	1.248	1.273	
75	1.093	1.097	1.102	1.107	1.112	1.117	1.121	1.127	1.131	1.141	1.151	1.161	1.165	1.170	1.180	1.190	1.204	1.214	1.219	1.238	1.263	
78	1.089	1.094	1.098	1.103	1.108	1.112	1.117	1.122	1.126	1.135	1.145	1.154	1.159	1.164	1.173	1.182	1.196	1.206	1.210	1.229	1.252	
81	1.086	1.092	1.095	1.099	1.104	1.108	1.113	1.117	1.122	1.131	1.140	1.149	1.153	1.158	1.167	1.176	1.189	1.198	1.203	1.221	1.243	
84	1.083	1.087	1.091	1.096	1.100	1.104	1.109	1.113	1.117	1.126	1.135	1.143	1.148	1.152	1.161	1.169	1.182	1.191	1.196	1.213	1.234	
15	1.283	1.395	1.514	1.639	1.771	1.909	2.052	2.201	2.358	2.679	3.021	3.379	3.564	3.753	4.142	4.544	5.170	5.801	5.802	6.722	7.898	
16	1.249	1.357	1.471	1.592	1.719	1.852	1.991	2.135	2.284	2.597	2.923	3.278	3.458	3.640	4.018	4.410	5.020	5.441	5.458	6.358	7.690	
17	1.218	1.321	1.432	1.548	1.671	1.800	1.933	2.073	2.217	2.521	2.843	3.181	3.356	3.535	3.903	4.285	4.881	5.292	5.302	6.355	7.494	
18	1.189	1.289	1.395	1.509	1.627	1.751	1.881	2.016	2.156	2.450	2.763	3.092	3.262	3.436	3.795	4.167	4.749	5.151	5.155	6.202	7.309	
19	1.162	1.259	1.362	1.471	1.585	1.706	1.832	1.962	2.098	2.384	2.688	3.008	3.174	3.344	3.694	4.057	4.625	5.018	5.019	6.047	7.133	
20	1.137	1.231	1.331	1.436	1.547	1.664	1.786	1.913	2.045	2.323	2.618	2.930	3.092	3.257	3.599	3.953	4.509	4.893	5.090	5.901	6.986	
21	1.115	1.205	1.302	1.404	1.512	1.624	1.743	1.867	1.995	2.265	2.553	2.858	3.014	3.175	3.505	3.855	4.393	4.775	4.987	5.783	6.807	
22	1.094	1.181	1.275	1.374	1.478	1.588	1.703	1.823	1.948	2.211	2.491	2.787	2.941	3.098	3.424	3.782	4.294	4.682	4.851	5.630	6.656	
23	1.074	1.159	1.249	1.346	1.447	1.554	1.666	1.782	1.904	2.160	2.433	2.722	2.872	3.028	3.344	3.675	4.195	4.568	4.740	5.504	6.511	
24	1.055	1.138	1.226	1.319	1.418	1.522	1.631	1.744	1.862	2.112	2.387	2.660	2.807	2.957								

TABLE 5.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.51$; $\frac{b_A}{t_W} = 11.0$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.77$; $\frac{p}{t_S} = 5.50$) - Concluded

$\frac{b_W}{t_W}$ $\frac{b_S}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
37	.8911	.9508	1.015	1.083	1.155	1.232	1.312	1.398	1.484	1.672	1.873	2.088	2.200	2.315	2.555	2.807	3.206	3.485	3.829	4.227	5.027
38	.8824	.9407	1.003	1.070	1.141	1.218	1.295	1.378	1.464	1.647	1.845	2.058	2.188	2.280	2.515	2.763	3.155	3.430	3.571	4.181	4.948
39	.8741	.9311	.9925	1.058	1.128	1.201	1.278	1.359	1.444	1.624	1.818	2.028	2.134	2.245	2.477	2.720	3.108	3.377	3.516	4.096	4.873
40	.8661	.9219	.9821	1.048	1.115	1.187	1.262	1.342	1.425	1.602	1.793	1.998	2.103	2.212	2.440	2.680	3.059	3.325	3.462	4.034	4.800
42	.8511	.9049	.9627	1.025	1.090	1.160	1.233	1.309	1.389	1.560	1.744	1.941	2.044	2.160	2.370	2.602	2.970	3.228	3.361	3.916	4.680
44	.8374	.8891	.9448	1.004	1.068	1.135	1.205	1.279	1.358	1.521	1.699	1.889	1.989	2.091	2.305	2.530	2.897	3.137	3.268	3.806	4.530
46	.8246	.8745	.9282	.9857	1.047	1.111	1.179	1.251	1.328	1.485	1.657	1.841	1.938	2.037	2.244	2.462	2.809	3.052	3.178	3.702	4.407
48	.8128	.8610	.9129	.9683	1.027	1.090	1.156	1.225	1.297	1.452	1.618	1.797	1.891	1.987	2.188	2.399	2.736	2.973	3.094	3.605	4.291
50	.8018	.8484	.8985	.9522	1.009	1.070	1.133	1.200	1.271	1.420	1.582	1.755	1.846	1.939	2.135	2.340	2.667	2.898	3.018	3.513	4.182
52	.7916	.8368	.8852	.9371	.9924	1.051	1.113	1.178	1.246	1.391	1.548	1.718	1.804	1.895	2.085	2.285	2.603	2.827	2.943	3.427	4.080
54	.7820	.8258	.8727	.9231	.9768	1.033	1.093	1.156	1.222	1.363	1.516	1.679	1.765	1.853	2.038	2.232	2.542	2.761	2.874	3.348	3.983
56	.7730	.8153	.8610	.9099	.9619	1.017	1.075	1.138	1.200	1.337	1.485	1.644	1.728	1.814	1.994	2.183	2.485	2.698	2.809	3.289	3.890
58	.7646	.8057	.8500	.8974	.9479	1.002	1.058	1.117	1.179	1.313	1.457	1.612	1.693	1.777	1.952	2.136	2.431	2.639	2.746	3.188	3.803
60	.7567	.7964	.8396	.8857	.9347	.9889	1.042	1.100	1.160	1.290	1.430	1.581	1.660	1.742	1.912	2.092	2.380	2.582	2.687	3.126	3.720
63	.7457	.7839	.8253	.8694	.9168	.9674	1.019	1.076	1.133	1.258	1.393	1.538	1.614	1.692	1.867	2.050	2.336	2.538	2.643	3.079	3.603
66	.7356	.7723	.8120	.8545	.8998	.9478	.9985	1.052	1.108	1.228	1.358	1.498	1.571	1.647	1.806	1.973	2.241	2.430	2.528	2.959	3.495
69	.7263	.7616	.8000	.8407	.8843	.9305	.9794	1.031	1.085	1.201	1.328	1.461	1.532	1.605	1.758	1.920	2.179	2.361	2.454	2.884	3.394
72	.7177	.7517	.7885	.8279	.8699	.9145	.9617	1.011	1.064	1.175	1.298	1.426	1.495	1.568	1.714	1.871	2.121	2.299	2.390	2.776	3.299
75	.7097	.7425	.7780	.8160	.8568	.8997	.9452	.9932	1.044	1.151	1.268	1.395	1.461	1.529	1.673	1.825	2.068	2.239	2.328	2.702	3.210
78	.7023	.7340	.7683	.8051	.8442	.8859	.9299	.9763	1.025	1.129	1.243	1.365	1.429	1.495	1.635	1.783	2.017	2.184	2.270	2.633	3.127
81	.6954	.7261	.7590	.7948	.8327	.8730	.9156	.9605	1.006	1.109	1.219	1.337	1.399	1.464	1.598	1.741	1.970	2.132	2.216	2.569	3.049
84	.6890	.7186	.7507	.7851	.8219	.8609	.9022	.9457	.9914	1.089	1.198	1.311	1.371	1.434	1.565	1.703	1.926	2.083	2.164	2.508	2.975
15	1.642	1.835	2.032	2.234	2.438	2.646	2.856	3.068	3.282	3.715	4.152	4.593	4.815	5.037	5.482	5.928	6.598	7.045	7.268	8.159	9.268
16	1.615	1.805	2.000	2.199	2.402	2.607	2.815	3.028	3.238	3.668	4.103	4.543	4.763	4.985	5.429	5.874	6.544	6.990	7.214	8.107	9.218
17	1.589	1.777	1.969	2.168	2.367	2.570	2.778	2.985	3.193	3.623	4.055	4.492	4.712	4.933	5.378	5.820	6.490	6.936	7.160	8.053	9.167
18	1.565	1.750	1.940	2.134	2.333	2.534	2.739	2.945	3.154	3.579	4.008	4.443	4.662	4.882	5.324	5.767	6.435	6.882	7.105	7.999	9.114
19	1.541	1.724	1.912	2.104	2.300	2.500	2.702	2.907	3.115	3.536	3.963	4.398	4.613	4.832	5.272	5.714	6.381	6.827	7.050	7.944	9.060
20	1.518	1.699	1.885	2.075	2.269	2.468	2.667	2.870	3.078	3.494	3.918	4.349	4.565	4.783	5.221	5.662	6.327	6.773	6.995	7.889	9.006
21	1.496	1.675	1.858	2.046	2.238	2.435	2.633	2.834	3.038	3.453	3.875	4.308	4.519	4.735	5.171	5.611	6.274	6.718	6.941	7.834	8.951
22	1.475	1.652	1.833	2.019	2.209	2.403	2.600	2.800	3.002	3.414	3.832	4.268	4.473	4.688	5.123	5.561	6.222	6.665	6.887	7.778	8.895
23	1.455	1.630	1.809	1.993	2.181	2.373	2.568	2.768	2.967	3.375	3.792	4.214	4.428	4.642	5.075	5.511	6.170	6.612	6.834	7.724	8.840
24	1.438	1.608	1.788	1.968	2.154	2.344	2.537	2.734	2.933	3.338	3.752	4.172	4.384	4.597	5.028	5.462	6.119	6.560	6.781	7.669	8.784
25	1.418	1.588	1.763	1.944	2.128	2.316	2.508	2.703	2.900	3.302	3.713	4.130	4.341	4.554	4.981	5.414	6.068	6.509	6.729	7.615	8.729
26	1.400	1.568	1.742	1.920	2.103	2.289	2.479	2.672	2.868	3.267	3.675	4.090	4.299	4.511	4.937	5.367	6.019	6.457	6.677	7.562	8.674
27	1.383	1.549	1.721	1.897	2.078	2.263	2.451	2.642	2.837	3.233	3.637	4.050	4.259	4.469	4.893	5.321	5.970	6.328	6.528	7.403	8.519
28	1.367	1.531	1.701	1.876	2.055	2.238	2.424	2.614	2.807	3.200	3.602	4.012	4.219	4.428	4.849	5.276	5.922	6.258	6.458	7.332	8.448
29	1.350	1.513	1.681	1.854	2.032	2.213	2.398	2.586	2.777	3.167	3.567	3.974	4.180	4.388	4.807	5.232	5.876	6.309	6.527	7.404	8.511
30	1.335	1.496	1.663	1.834	2.010	2.190	2.373	2.559	2.749	3.136	3.533	3.937	4.142	4.349	4.766	5.188	5.829	6.261	6.479	7.353	8.457
31	1.320	1.479	1.645	1.814	1.988	2.166	2.348	2.533	2.721	3.108	3.500	3.901	4.106	4.311	4.725	5.148	5.784	6.204	6.431	7.303	8.404
32	1.306	1.464	1.627	1.795	1.968	2.144	2.324	2.508	2.694	3.078	3.467	3.867	4.069	4.273	4.688	5.104	5.740	6.168	6.384	7.252	8.352
33	1.292	1.448	1.609	1.776	1.947	2.122	2.301	2.483	2.668	3.047	3.436	3.833	4.034	4.234	4.647	5.063	5.698	6.123	6.338	7.204	8.300
34	1.279	1.433	1.593	1.758	1.928	2.102	2.279	2.459	2.643	3.019	3.405	3.799	3.999	4.201	4.609	5.023	5.653	6.079	6.292	7.158	8.248
35	1.268	1.419	1.577	1.741	1.909	2.081	2.257	2.438	2.618	2.992	3.375	3.767	3.968	4.165	4.572	4.984	5.611	6.035	6.248	7.109	8.198
36	1.253	1.405	1.562	1.724	1.890	2.061	2.235	2.413	2.594	2.965	3.348	3.735	3.933	4.132	4.538	4.948	5.570	5.992	6.204	7.061	8.148
37	1.241	1.391	1.547	1.709	1.873	2.042	2.215	2.391	2.571	2.939	3.317	3.701	3.901	4.099	4.501	4.908	5.530	5.949	6.161	7.015	8.093
38	1.229	1.378	1.532	1.692	1.855	2.023	2.195	2.370	2.548	2.914	3.289	3.674	3.869	4.065	4.468	4.872	5.490	5.908	6.119	6.970	8.050
39	1.218	1.365	1.518	1.678	1.838	2.005	2.175	2.349	2.526	2.889	3.262	3.644	3.839	4.035	4.432	4.835	5.451	5.867	6.077	6.925	8.002
40	1.207	1.352	1.504	1.661	1.822	1.987	2.156	2.329	2.504	2.865	3.235	3.615	3.808	4.004	4.399	4.800	5.413	5.827	6.036	6.881	7.954
42	1.186	1.329	1.478	1.632	1.789	1.953	2.119	2.289	2.463	2.818	3.184	3.559	3.750	3.943	4.334	4.732	5.339	5.749	5.957	6.795	7.861
44	1.165	1.308	1.453	1.604	1.760	1.921	2.085	2.252	2.423	2.774	3.135	3.508	3.695	3.885	4.272	4.668	5.267	5.674	5.880	6.712	7.771
46	1.146	1.285	1.429	1.578	1.732	1.890	2.051	2.217	2.384	2.731	3.088	3.455	3.641	3.830	4.213	4.602	5.198	5.602	5.808	6.631	7.683
48	1.128	1.264	1.405	1.552	1.704	1.860	2.018	2.183	2.347	2.691	3.043	3.405	3.590	3.777	4.155	4.541	5.131	5.532	5.734	6.552	7.593
50	1.111	1.245	1.385	1.530	1.679	1.832	1.989	2.150	2.313	2.652	3.000	3.359	3.541	3.728	4.100	4.483	5.067	5.464	5.664	6.477	7.515
52	1.094	1.227	1.365	1.507	1.654	1.805	1.961	2.119	2.282	2.615	2.959	3.313	3.494	3.677	4.047	4.426	5.005	5.398	5.597	6.404	7.434
54	1.079	1.209	1.346	1.485	1.630	1.780	1.933	2.090													

TABLE 6.- Z-PANEL PROPERTIES $\left(\frac{t_W}{t_S} = 0.63; \frac{b_A}{t_W} = 9.7; \frac{b_F}{b_W} = 0.4; \frac{d}{t_S} = 1.92; \frac{p}{t_S} = 6.27\right)$

$\frac{b_W}{t_W}$	$\frac{b_S}{t_S}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
15	15	1.627	1.664	1.701	1.738	1.775	1.812	1.849	1.886	1.923	1.968	2.072	2.146	2.183	2.220	2.924	2.368	2.479	2.553	2.580	2.738	2.924
16	16	1.588	1.623	1.657	1.692	1.727	1.762	1.796	1.831	1.866	1.935	2.005	2.074	2.109	2.144	2.213	2.283	2.387	2.458	2.491	2.630	2.803
17	17	1.553	1.586	1.619	1.651	1.684	1.717	1.749	1.782	1.815	1.880	1.946	2.011	2.044	2.078	2.142	2.207	2.305	2.370	2.403	2.534	2.697
18	18	1.523	1.554	1.584	1.615	1.646	1.677	1.708	1.739	1.770	1.831	1.893	1.955	1.986	2.017	2.078	2.140	2.233	2.294	2.325	2.449	2.603
19	19	1.495	1.524	1.554	1.583	1.612	1.641	1.671	1.700	1.729	1.788	1.846	1.905	1.934	1.963	2.021	2.080	2.168	2.226	2.255	2.372	2.519
20	20	1.470	1.498	1.526	1.554	1.581	1.609	1.637	1.665	1.693	1.748	1.804	1.859	1.887	1.915	1.970	2.026	2.109	2.165	2.193	2.304	2.443
21	21	1.448	1.474	1.501	1.527	1.554	1.580	1.607	1.633	1.660	1.713	1.765	1.818	1.845	1.871	1.924	1.977	2.057	2.109	2.136	2.242	2.374
22	22	1.428	1.453	1.478	1.503	1.529	1.554	1.579	1.604	1.630	1.680	1.731	1.781	1.808	1.832	1.882	1.933	2.005	2.059	2.085	2.185	2.312
23	23	1.409	1.433	1.457	1.481	1.506	1.530	1.554	1.578	1.602	1.651	1.699	1.747	1.771	1.796	1.844	1.892	1.965	2.013	2.037	2.134	2.255
24	24	1.392	1.415	1.438	1.461	1.485	1.508	1.531	1.554	1.577	1.624	1.670	1.716	1.739	1.762	1.809	1.855	1.924	1.971	1.994	2.087	2.202
25	25	1.376	1.399	1.421	1.443	1.465	1.487	1.510	1.532	1.554	1.599	1.643	1.687	1.710	1.732	1.778	1.821	1.887	1.932	1.954	2.043	2.154
26	26	1.362	1.383	1.405	1.428	1.447	1.469	1.490	1.511	1.533	1.576	1.618	1.661	1.682	1.704	1.748	1.789	1.853	1.896	1.917	2.003	2.110
27	27	1.348	1.369	1.390	1.410	1.431	1.451	1.472	1.492	1.513	1.554	1.595	1.637	1.657	1.678	1.719	1.760	1.822	1.863	1.883	1.968	2.069
28	28	1.336	1.356	1.376	1.395	1.415	1.435	1.455	1.475	1.495	1.534	1.574	1.614	1.634	1.653	1.693	1.733	1.792	1.832	1.852	1.931	2.031
29	29	1.324	1.344	1.363	1.382	1.401	1.420	1.439	1.459	1.478	1.516	1.554	1.593	1.612	1.631	1.669	1.708	1.765	1.803	1.823	1.899	1.995
30	30	1.314	1.332	1.351	1.369	1.388	1.406	1.425	1.443	1.462	1.499	1.536	1.573	1.591	1.610	1.647	1.684	1.740	1.777	1.795	1.869	1.982
31	31	1.303	1.321	1.339	1.357	1.375	1.393	1.411	1.429	1.447	1.483	1.519	1.554	1.572	1.590	1.626	1.662	1.716	1.752	1.769	1.841	1.931
32	32	1.294	1.311	1.329	1.346	1.363	1.381	1.398	1.416	1.433	1.468	1.502	1.537	1.554	1.572	1.607	1.641	1.693	1.728	1.745	1.815	1.902
33	33	1.285	1.302	1.319	1.336	1.352	1.369	1.386	1.403	1.420	1.453	1.487	1.521	1.538	1.554	1.588	1.622	1.672	1.708	1.723	1.790	1.874
34	34	1.277	1.293	1.309	1.326	1.342	1.358	1.375	1.391	1.408	1.440	1.472	1.506	1.522	1.538	1.571	1.604	1.653	1.685	1.702	1.767	1.849
35	35	1.269	1.285	1.301	1.316	1.332	1.348	1.364	1.380	1.396	1.428	1.459	1.491	1.507	1.523	1.555	1.586	1.634	1.668	1.682	1.745	1.824
36	36	1.261	1.277	1.292	1.308	1.323	1.339	1.354	1.369	1.385	1.416	1.447	1.477	1.493	1.508	1.539	1.570	1.616	1.647	1.663	1.724	1.803
37	37	1.254	1.269	1.284	1.299	1.314	1.329	1.344	1.359	1.374	1.404	1.434	1.464	1.479	1.495	1.525	1.555	1.600	1.630	1.645	1.705	1.780
38	38	1.248	1.262	1.277	1.291	1.306	1.321	1.335	1.350	1.365	1.394	1.423	1.452	1.467	1.482	1.511	1.540	1.584	1.613	1.628	1.686	1.769
39	39	1.241	1.255	1.270	1.284	1.298	1.312	1.327	1.341	1.355	1.384	1.412	1.441	1.455	1.469	1.498	1.526	1.569	1.597	1.612	1.669	1.740
40	40	1.235	1.249	1.263	1.277	1.291	1.305	1.319	1.332	1.346	1.374	1.402	1.430	1.444	1.457	1.485	1.513	1.555	1.582	1.596	1.652	1.721
42	42	1.224	1.237	1.250	1.264	1.277	1.290	1.303	1.317	1.330	1.356	1.383	1.409	1.422	1.436	1.462	1.489	1.528	1.555	1.568	1.621	1.687
44	44	1.214	1.226	1.239	1.252	1.264	1.277	1.290	1.302	1.315	1.340	1.365	1.391	1.403	1.416	1.441	1.466	1.504	1.530	1.542	1.593	1.656
46	46	1.204	1.217	1.229	1.241	1.253	1.265	1.277	1.289	1.301	1.325	1.349	1.374	1.386	1.398	1.422	1.446	1.482	1.508	1.519	1.567	1.627
48	48	1.196	1.208	1.219	1.231	1.242	1.254	1.265	1.277	1.289	1.311	1.334	1.358	1.370	1.381	1.404	1.428	1.462	1.485	1.497	1.543	1.601
50	50	1.188	1.199	1.210	1.221	1.233	1.244	1.255	1.266	1.277	1.299	1.321	1.344	1.355	1.366	1.388	1.410	1.444	1.468	1.477	1.522	1.577
52	52	1.181	1.192	1.203	1.213	1.224	1.234	1.245	1.256	1.266	1.288	1.309	1.330	1.341	1.352	1.373	1.395	1.427	1.448	1.457	1.501	1.555
54	54	1.174	1.185	1.195	1.205	1.215	1.226	1.236	1.246	1.257	1.277	1.298	1.318	1.329	1.339	1.359	1.380	1.411	1.431	1.442	1.483	1.534
56	56	1.168	1.178	1.188	1.198	1.208	1.218	1.228	1.237	1.247	1.267	1.287	1.307	1.317	1.327	1.347	1.366	1.396	1.416	1.426	1.466	1.515
58	58	1.162	1.172	1.181	1.191	1.201	1.210	1.220	1.229	1.238	1.258	1.277	1.296	1.306	1.315	1.335	1.354	1.383	1.402	1.411	1.450	1.497
60	60	1.157	1.166	1.175	1.185	1.194	1.203	1.212	1.222	1.231	1.249	1.268	1.286	1.296	1.305	1.323	1.342	1.370	1.388	1.398	1.435	1.481
63	63	1.149	1.158	1.167	1.176	1.185	1.193	1.202	1.211	1.220	1.238	1.255	1.273	1.282	1.290	1.308	1.326	1.352	1.370	1.379	1.414	1.458
66	66	1.143	1.151	1.159	1.168	1.176	1.185	1.193	1.202	1.210	1.227	1.244	1.260	1.269	1.277	1.294	1.311	1.336	1.353	1.361	1.395	1.437
69	69	1.136	1.144	1.152	1.160	1.169	1.177	1.185	1.193	1.201	1.217	1.233	1.249	1.257	1.265	1.281	1.297	1.322	1.338	1.346	1.379	1.418
72	72	1.131	1.138	1.146	1.154	1.162	1.169	1.177	1.185	1.192	1.209	1.223	1.239	1.246	1.254	1.270	1.285	1.308	1.324	1.331	1.362	1.401
75	75	1.125	1.133	1.140	1.148	1.155	1.162	1.170	1.177	1.185	1.200	1.214	1.229	1.237	1.244	1.259	1.274	1.296	1.311	1.318	1.348	1.385
78	78	1.121	1.128	1.135	1.142	1.149	1.156	1.163	1.171	1.178	1.192	1.206	1.220	1.227	1.235	1.249	1.263	1.284	1.299	1.306	1.334	1.370
81	81	1.118	1.123	1.130	1.137	1.144	1.150	1.157	1.164	1.171	1.185	1.198	1.212	1.219	1.226	1.240	1.253	1.274	1.288	1.294	1.322	1.358
84	84	1.112	1.119	1.125	1.132	1.138	1.145	1.152	1.158	1.165	1.178	1.191	1.205	1.211	1.218	1.231	1.244	1.264	1.277	1.284	1.310	1.344
15	15	1.736	1.916	2.106	2.305	2.512	2.728	2.951	3.181	3.418	3.911	4.427	4.963	5.237	5.517	6.087	6.673	7.577	8.194	8.507	9.783	11.43
16	16	1.688	1.862	2.045	2.238	2.439	2.649	2.868	3.090	3.321	3.801	4.304	4.828	5.097	5.370	5.930	6.504	7.391	7.998	8.306	9.583	11.18
17	17	1.643	1.811	1.989	2.178	2.372	2.575	2.786	3.004	3.229	3.698	4.189	4.702	4.965	5.232	5.780	6.344	7.215	7.812	8.115	9.352	10.95
18	18	1.601	1.764	1.937	2.119	2.309	2.507	2.712	2.924	3.144	3.601	4.081	4.582	4.840	5.102	5.639	6.192	7.048	7.635	7.933	9.151	10.73
19	19	1.562	1.721	1.888	2.065	2.250	2.442	2.642	2.849	3.063	3.510	3.979	4.469	4.722	4.979	5.505	6.048	6.889	7.468	7.759	8.980	10.51
20	20	1.526	1.680	1.843	2.014	2.194	2.382	2.577	2.779	2.987	3.423	3.882	4.363	4.610	4.862	5.378	5.911	6.738	7.308	7.594	8.776	10.31
21	21	1.492	1.642	1.800	1.967	2.142	2.325	2.515	2.712	2.916	3.342	3.791	4.261	4.504	4.751	5.258	5.781	6.593	7.152	7.438	8.600	10.11
22	22	1.461	1.608	1.760	1.923	2.093	2.272	2.457	2.650	2.849	3.265	3.705	4.165	4.403	4.645	5.143	5.657	6.455	7.005	7.284	8.432	9.924
23	23	1.431	1.572	1.723	1.881	2.047	2															

TABLE 6.- Z-PANEL PROPERTIES ($\frac{t_w}{t_s} = 0.63$; $\frac{b_A}{t_w} = 9.7$; $\frac{b_F}{b_w} = 0.4$; $\frac{d}{t_s} = 1.92$; $\frac{p}{t_s} = 6.27$) - Concluded

$\frac{b_F}{t_s}$	$\frac{b_w}{t_w}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	36	40	45
37		1.150	1.253	1.362	1.479	1.602	1.731	1.867	2.009	2.156	2.467	2.789	3.151	3.334	3.521	3.908	4.312	4.948	5.387	5.612	6.545	7.777
38		1.138	1.237	1.345	1.464	1.580	1.707	1.840	1.979	2.124	2.430	2.757	3.103	3.283	3.468	3.849	4.247	4.872	5.307	5.529	6.451	7.688
39		1.123	1.222	1.328	1.440	1.558	1.683	1.814	1.951	2.093	2.394	2.718	3.058	3.234	3.415	3.792	4.184	4.801	5.230	5.449	6.380	7.563
40		1.111	1.209	1.311	1.421	1.538	1.661	1.789	1.924	2.064	2.360	2.676	3.012	3.188	3.365	3.738	4.123	4.732	5.155	5.372	6.271	7.460
42		1.087	1.180	1.280	1.387	1.499	1.618	1.742	1.872	2.008	2.294	2.601	2.927	3.098	3.270	3.631	4.007	4.600	5.013	5.224	6.101	7.284
44		1.065	1.155	1.252	1.354	1.463	1.578	1.698	1.824	1.955	2.234	2.531	2.848	3.012	3.181	3.532	3.898	4.478	4.879	5.085	5.942	7.078
46		1.045	1.132	1.225	1.325	1.430	1.541	1.658	1.780	1.907	2.177	2.468	2.773	2.933	3.098	3.439	3.798	4.359	4.752	4.953	5.791	6.902
48		1.026	1.110	1.200	1.297	1.399	1.506	1.619	1.738	1.861	2.123	2.405	2.703	2.859	3.020	3.352	3.700	4.249	4.633	4.830	5.648	6.738
50		1.008	1.090	1.177	1.271	1.370	1.474	1.584	1.699	1.819	2.072	2.347	2.638	2.790	2.948	3.270	3.609	4.145	4.520	4.712	5.512	6.577
52		.9913	1.071	1.155	1.246	1.342	1.444	1.550	1.662	1.779	2.028	2.292	2.578	2.724	2.878	3.192	3.524	4.047	4.413	4.601	5.384	6.427
54		.9758	1.053	1.135	1.223	1.317	1.415	1.519	1.627	1.741	1.982	2.241	2.518	2.662	2.811	3.119	3.442	3.954	4.312	4.498	5.262	6.284
56		.9613	1.038	1.118	1.202	1.292	1.388	1.489	1.595	1.705	1.940	2.193	2.463	2.603	2.748	3.049	3.368	3.868	4.216	4.396	5.148	6.148
58		.9476	1.020	1.098	1.181	1.270	1.363	1.461	1.564	1.672	1.901	2.147	2.410	2.548	2.689	2.984	3.292	3.782	4.125	4.300	5.035	6.018
60		.9347	1.005	1.081	1.162	1.248	1.339	1.435	1.535	1.640	1.864	2.104	2.367	2.495	2.633	2.921	3.223	3.702	4.038	4.210	4.930	5.893
63		.9187	.9845	1.057	1.135	1.218	1.306	1.398	1.495	1.596	1.811	2.043	2.291	2.421	2.555	2.833	3.125	3.589	3.915	4.082	4.781	5.717
66		.9001	.9653	1.036	1.111	1.190	1.275	1.364	1.457	1.554	1.763	1.987	2.227	2.352	2.482	2.751	3.034	3.484	3.800	3.962	4.641	5.552
69		.8848	.9477	1.015	1.088	1.165	1.248	1.332	1.422	1.518	1.717	1.934	2.167	2.288	2.414	2.675	2.949	3.388	3.693	3.850	4.511	5.397
72		.8706	.9313	.9968	1.067	1.141	1.219	1.302	1.390	1.481	1.675	1.885	2.110	2.228	2.350	2.603	2.870	3.294	3.592	3.746	4.388	5.252
76		.8574	.9160	.9792	1.047	1.119	1.195	1.275	1.359	1.448	1.636	1.840	2.068	2.173	2.290	2.536	2.798	3.208	3.498	3.647	4.273	5.114
78		.8452	.9019	.9629	1.028	1.098	1.172	1.249	1.331	1.417	1.600	1.797	2.009	2.120	2.235	2.474	2.726	3.127	3.409	3.554	4.164	4.985
81		.8337	.8886	.9478	1.011	1.079	1.150	1.225	1.306	1.388	1.565	1.757	1.963	2.071	2.182	2.415	2.660	3.050	3.325	3.467	4.061	4.862
84		.8230	.8762	.9336	.9950	1.060	1.130	1.203	1.280	1.361	1.533	1.719	1.918	2.025	2.133	2.359	2.598	2.978	3.246	3.384	3.964	4.748
15		2.236	2.495	2.758	3.024	3.293	3.564	3.836	4.109	4.384	4.934	5.485	6.037	6.312	6.587	7.137	7.683	8.499	9.040	9.309	10.38	11.70
16		2.205	2.462	2.723	2.988	3.255	3.524	3.795	4.068	4.342	4.892	5.442	5.994	6.270	6.545	7.095	7.644	8.463	9.006	9.277	10.35	11.68
17		2.176	2.431	2.690	2.952	3.218	3.486	3.756	4.027	4.300	4.848	5.398	5.949	6.225	6.502	7.053	7.603	8.425	8.970	9.242	10.32	11.66
18		2.147	2.399	2.657	2.917	3.181	3.448	3.717	3.987	4.259	4.806	5.356	5.907	6.183	6.459	7.011	7.562	8.385	8.932	9.205	10.29	11.63
19		2.119	2.370	2.625	2.884	3.146	3.411	3.673	3.948	4.219	4.764	5.313	5.863	6.139	6.415	6.967	7.519	8.344	8.892	9.166	10.26	11.60
20		2.092	2.341	2.594	2.851	3.111	3.375	3.641	3.909	4.179	4.722	5.270	5.820	6.095	6.371	6.923	7.475	8.301	8.851	9.125	10.22	11.57
21		2.066	2.312	2.563	2.819	3.078	3.339	3.604	3.871	4.139	4.681	5.227	5.778	6.052	6.327	6.879	7.431	8.258	8.809	9.084	10.18	11.54
22		2.041	2.285	2.534	2.788	3.045	3.306	3.568	3.833	4.101	4.641	5.185	5.733	6.008	6.283	6.835	7.387	8.215	8.768	9.041	10.14	11.50
23		2.017	2.259	2.506	2.757	3.013	3.271	3.533	3.797	4.063	4.601	5.144	5.690	5.965	6.239	6.790	7.342	8.170	8.722	8.998	10.10	11.46
24		1.994	2.233	2.478	2.728	2.981	3.238	3.499	3.761	4.026	4.561	5.103	5.648	5.922	6.196	6.746	7.298	8.126	8.678	8.954	10.06	11.42
25		1.971	2.208	2.451	2.699	2.951	3.206	3.465	3.728	3.990	4.523	5.062	5.608	5.879	6.153	6.702	7.253	8.081	8.633	8.909	10.01	11.38
26		1.949	2.184	2.425	2.671	2.921	3.175	3.432	3.692	3.954	4.485	5.022	5.564	5.837	6.110	6.659	7.209	8.036	8.588	8.865	9.968	11.34
27		1.928	2.161	2.400	2.644	2.892	3.145	3.400	3.660	3.919	4.448	4.983	5.523	5.795	6.068	6.615	7.165	7.992	8.544	8.820	9.924	11.30
28		1.907	2.138	2.375	2.618	2.864	3.115	3.369	3.628	3.885	4.411	4.944	5.483	5.754	6.028	6.572	7.121	7.947	8.499	8.775	9.879	11.26
29		1.887	2.116	2.352	2.592	2.837	3.088	3.338	3.594	3.852	4.375	4.908	5.443	5.713	5.985	6.530	7.077	7.903	8.454	8.730	9.834	11.21
30		1.867	2.095	2.328	2.567	2.810	3.058	3.306	3.563	3.819	4.340	4.869	5.404	5.673	5.944	6.488	7.034	7.860	8.409	8.685	9.789	11.17
31		1.848	2.074	2.306	2.543	2.784	3.030	3.279	3.532	3.787	4.305	4.832	5.365	5.634	5.904	6.448	6.992	7.814	8.364	8.640	9.744	11.12
32		1.830	2.054	2.284	2.519	2.759	3.003	3.251	3.502	3.756	4.272	4.798	5.327	5.595	5.864	6.405	6.949	7.770	8.320	8.596	9.699	11.08
33		1.812	2.034	2.262	2.496	2.734	2.977	3.223	3.473	3.725	4.239	4.761	5.290	5.556	5.824	6.364	6.907	7.727	8.276	8.551	9.654	11.03
34		1.795	2.015	2.242	2.474	2.710	2.951	3.198	3.444	3.695	4.206	4.728	5.253	5.519	5.788	6.324	6.865	7.684	8.232	8.507	9.609	10.99
35		1.778	1.997	2.221	2.452	2.687	2.926	3.169	3.416	3.666	4.174	4.691	5.217	5.482	5.748	6.284	6.825	7.641	8.189	8.463	9.564	10.94
36		1.762	1.979	2.202	2.430	2.664	2.902	3.143	3.389	3.637	4.143	4.658	5.181	5.445	5.710	6.245	6.785	7.599	8.145	8.419	9.519	10.90
37		1.746	1.961	2.182	2.409	2.641	2.878	3.118	3.362	3.609	4.112	4.625	5.148	5.409	5.674	6.207	6.744	7.557	8.102	8.376	9.475	10.85
38		1.730	1.944	2.166	2.389	2.620	2.854	3.093	3.336	3.582	4.082	4.593	5.112	5.374	5.637	6.168	6.704	7.518	8.060	8.333	9.430	10.81
39		1.715	1.927	2.145	2.369	2.598	2.832	3.069	3.310	3.555	4.053	4.561	5.078	5.339	5.601	6.131	6.665	7.475	8.018	8.291	9.388	10.76
40		1.700	1.911	2.128	2.350	2.577	2.809	3.045	3.285	3.528	4.024	4.530	5.044	5.304	5.566	6.094	6.627	7.434	7.976	8.248	9.342	10.72
42		1.672	1.879	2.093	2.312	2.537	2.768	3.000	3.237	3.477	3.968	4.469	4.980	5.237	5.497	6.022	6.551	7.354	7.894	8.165	9.256	10.63
44		1.645	1.850	2.060	2.277	2.498	2.725	2.956	3.190	3.428	3.914	4.411	4.918	5.173	5.431	5.951	6.478	7.278	7.814	8.083	9.170	10.54
46		1.620	1.821	2.029	2.243	2.462	2.685	2.913	3.145	3.381	3.868	4.354	4.858	5.110	5.368	5.883	6.406	7.201	7.735	8.004	9.088	10.45
48		1.595	1.794	1.999	2.210	2.428	2.647	2.873	3.102	3.336	3.812	4.300	4.797	5.049	5.303	5.817	6.337	7.128	7.658	7.928	9.004	10.37
50		1.572	1.768	1.970	2.179	2.393	2.611	2.834	3.061	3.292	3.763	4.247	4.740	4.990	5.242	5.752	6.269	7.054				

TABLE 7.- Z-PANEL PROPERTIES ($\frac{t_W}{t_S} = 0.79$; $\frac{b_A}{t_W} = 8.2$; $\frac{b_F}{b_W} = 0.4$; $\frac{d}{t_S} = 1.97$; $\frac{p}{t_S} = 6.36$)

$\frac{a}{t} \frac{b}{t} \frac{p}{t}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	38	40	45
15	1.988	2.044	2.103	2.161	2.219	2.277	2.336	2.394	2.452	2.509	2.566	2.623	2.680	2.737	2.794	2.851	2.908	2.965	3.022	3.079	3.136
16	1.924	1.979	2.034	2.088	2.143	2.198	2.252	2.307	2.361	2.415	2.469	2.523	2.577	2.631	2.685	2.739	2.793	2.847	2.901	2.955	3.009
17	1.870	1.922	1.973	2.024	2.076	2.127	2.178	2.230	2.281	2.332	2.383	2.434	2.485	2.536	2.587	2.638	2.689	2.740	2.791	2.842	2.893
18	1.822	1.870	1.919	1.967	2.016	2.065	2.113	2.162	2.210	2.257	2.305	2.353	2.401	2.449	2.497	2.545	2.593	2.641	2.689	2.737	2.785
19	1.779	1.825	1.870	1.916	1.962	2.008	2.054	2.100	2.146	2.191	2.237	2.282	2.327	2.372	2.417	2.462	2.507	2.552	2.597	2.642	2.687
20	1.740	1.783	1.827	1.871	1.914	1.958	2.002	2.045	2.089	2.132	2.175	2.218	2.261	2.304	2.347	2.390	2.433	2.476	2.519	2.562	2.605
21	1.704	1.746	1.788	1.829	1.871	1.912	1.954	1.996	2.037	2.100	2.162	2.224	2.286	2.348	2.410	2.472	2.534	2.596	2.658	2.720	2.782
22	1.672	1.712	1.752	1.792	1.831	1.871	1.911	1.950	1.990	2.070	2.149	2.228	2.307	2.386	2.465	2.544	2.623	2.702	2.781	2.860	2.939
23	1.643	1.681	1.719	1.757	1.795	1.833	1.871	1.909	1.947	2.023	2.099	2.175	2.251	2.327	2.403	2.479	2.555	2.631	2.707	2.783	2.859
24	1.616	1.653	1.689	1.726	1.762	1.798	1.835	1.871	1.908	1.980	2.053	2.128	2.202	2.276	2.350	2.424	2.498	2.572	2.646	2.720	2.794
25	1.592	1.627	1.662	1.697	1.732	1.766	1.801	1.836	1.871	1.941	2.011	2.081	2.151	2.221	2.291	2.361	2.431	2.501	2.571	2.641	2.711
26	1.569	1.603	1.636	1.670	1.703	1.737	1.771	1.804	1.838	1.905	1.972	2.039	2.107	2.174	2.241	2.308	2.375	2.442	2.509	2.576	2.643
27	1.548	1.580	1.613	1.645	1.677	1.710	1.742	1.774	1.807	1.871	1.936	2.001	2.066	2.131	2.196	2.261	2.326	2.391	2.456	2.521	2.586
28	1.528	1.560	1.591	1.622	1.653	1.684	1.716	1.747	1.778	1.840	1.903	1.965	1.998	2.028	2.090	2.152	2.214	2.276	2.338	2.400	2.462
29	1.510	1.540	1.570	1.600	1.631	1.661	1.691	1.721	1.751	1.811	1.872	1.932	1.992	2.052	2.113	2.203	2.263	2.323	2.383	2.443	2.503
30	1.493	1.522	1.551	1.580	1.610	1.639	1.668	1.697	1.726	1.784	1.843	1.901	1.959	2.017	2.076	2.163	2.221	2.279	2.337	2.395	2.453
31	1.477	1.505	1.534	1.562	1.590	1.618	1.646	1.674	1.703	1.759	1.815	1.872	1.900	1.928	1.985	2.041	2.126	2.182	2.210	2.238	2.266
32	1.462	1.490	1.517	1.544	1.571	1.600	1.626	1.653	1.681	1.735	1.790	1.845	1.872	1.900	1.954	2.008	2.080	2.145	2.172	2.201	2.228
33	1.448	1.476	1.501	1.528	1.554	1.581	1.607	1.634	1.660	1.713	1.768	1.819	1.845	1.872	1.925	1.978	2.057	2.110	2.137	2.243	2.270
34	1.435	1.461	1.486	1.512	1.538	1.564	1.589	1.615	1.641	1.692	1.743	1.795	1.821	1.848	1.898	1.949	2.028	2.078	2.103	2.208	2.235
35	1.423	1.448	1.473	1.498	1.523	1.547	1.572	1.597	1.622	1.672	1.722	1.772	1.797	1.822	1.872	1.922	1.997	2.047	2.102	2.172	2.228
36	1.411	1.435	1.459	1.484	1.508	1.532	1.557	1.581	1.605	1.654	1.702	1.751	1.775	1.799	1.848	1.898	1.969	2.018	2.042	2.139	2.260
37	1.400	1.423	1.447	1.471	1.495	1.518	1.542	1.565	1.589	1.638	1.683	1.730	1.753	1.778	1.825	1.872	1.943	1.990	2.014	2.108	2.228
38	1.389	1.412	1.435	1.458	1.481	1.504	1.527	1.550	1.573	1.619	1.665	1.711	1.734	1.757	1.803	1.849	1.918	1.964	1.987	2.079	2.194
39	1.379	1.402	1.424	1.447	1.469	1.491	1.514	1.536	1.559	1.603	1.648	1.693	1.715	1.738	1.783	1.827	1.895	1.939	1.962	2.051	2.163
40	1.370	1.392	1.414	1.436	1.457	1.479	1.501	1.523	1.545	1.588	1.632	1.676	1.697	1.719	1.763	1.807	1.872	1.916	1.938	2.025	2.134
42	1.352	1.373	1.394	1.415	1.435	1.456	1.477	1.498	1.519	1.560	1.602	1.643	1.664	1.685	1.727	1.768	1.831	1.872	1.893	1.978	2.080
44	1.338	1.358	1.378	1.398	1.418	1.438	1.458	1.478	1.498	1.535	1.575	1.614	1.634	1.654	1.694	1.733	1.793	1.833	1.853	1.932	2.031
46	1.322	1.341	1.360	1.379	1.398	1.417	1.436	1.455	1.474	1.512	1.550	1.588	1.608	1.628	1.668	1.701	1.758	1.798	1.815	1.891	1.988
48	1.308	1.326	1.345	1.363	1.381	1.399	1.417	1.436	1.454	1.490	1.527	1.563	1.581	1.599	1.638	1.672	1.727	1.763	1.781	1.854	1.945
50	1.298	1.313	1.331	1.348	1.366	1.383	1.401	1.418	1.436	1.471	1.508	1.541	1.558	1.575	1.610	1.645	1.698	1.733	1.750	1.820	1.907
52	1.284	1.301	1.318	1.335	1.352	1.369	1.385	1.402	1.419	1.453	1.488	1.520	1.536	1.553	1.587	1.621	1.671	1.704	1.721	1.789	1.873
54	1.274	1.290	1.308	1.323	1.339	1.355	1.371	1.387	1.403	1.436	1.468	1.501	1.517	1.533	1.565	1.598	1.646	1.678	1.695	1.759	1.840
56	1.264	1.280	1.295	1.311	1.327	1.342	1.358	1.373	1.389	1.420	1.451	1.483	1.498	1.514	1.545	1.578	1.623	1.654	1.670	1.732	1.810
58	1.255	1.270	1.285	1.300	1.315	1.330	1.345	1.360	1.376	1.406	1.436	1.468	1.481	1.498	1.528	1.558	1.602	1.631	1.647	1.707	1.782
60	1.247	1.261	1.276	1.290	1.305	1.319	1.334	1.349	1.363	1.392	1.421	1.450	1.465	1.480	1.509	1.538	1.582	1.611	1.625	1.683	1.758
63	1.235	1.249	1.263	1.278	1.290	1.304	1.318	1.332	1.346	1.374	1.401	1.429	1.443	1.457	1.484	1.512	1.554	1.581	1.595	1.651	1.720
65	1.224	1.237	1.251	1.264	1.277	1.290	1.304	1.317	1.330	1.357	1.383	1.410	1.423	1.436	1.462	1.489	1.529	1.555	1.568	1.621	1.687
69	1.214	1.227	1.240	1.252	1.265	1.278	1.290	1.303	1.316	1.341	1.368	1.392	1.404	1.417	1.442	1.468	1.506	1.531	1.544	1.594	1.658
72	1.205	1.218	1.230	1.242	1.254	1.266	1.278	1.290	1.303	1.327	1.351	1.375	1.387	1.400	1.424	1.448	1.485	1.509	1.521	1.570	1.630
75	1.197	1.209	1.221	1.232	1.244	1.256	1.267	1.279	1.290	1.314	1.337	1.360	1.372	1.384	1.407	1.430	1.465	1.488	1.500	1.547	1.605
78	1.190	1.201	1.212	1.223	1.234	1.246	1.257	1.268	1.279	1.302	1.324	1.347	1.358	1.369	1.391	1.414	1.447	1.470	1.481	1.528	1.582
81	1.183	1.193	1.204	1.215	1.226	1.237	1.247	1.258	1.269	1.291	1.312	1.334	1.344	1.355	1.377	1.398	1.431	1.452	1.463	1.508	1.560
84	1.176	1.187	1.197	1.207	1.218	1.228	1.239	1.249	1.259	1.280	1.301	1.322	1.332	1.343	1.363	1.384	1.415	1.436	1.447	1.488	1.540
15	2.434	2.708	2.985	3.265	3.605	3.825	4.254	4.693	4.939	5.653	6.394	7.158	7.547	7.842	8.743	9.560	10.81	11.68	12.09	13.83	16.08
16	2.371	2.638	2.919	3.211	3.514	3.827	4.160	4.482	4.822	5.223	6.251	7.003	7.397	7.775	8.566	9.372	10.81	11.45	11.88	13.60	15.80
17	2.312	2.573	2.847	3.132	3.429	3.735	4.052	4.377	4.710	5.399	6.115	6.855	7.233	7.616	8.398	9.192	10.41	11.25	11.67	13.37	15.56
18	2.257	2.511	2.779	3.058	3.348	3.648	3.958	4.277	4.605	5.281	5.986	6.714	7.087	7.464	8.233	9.020	10.23	11.05	11.47	13.16	15.32
19	2.205	2.453	2.715	2.988	3.272	3.566	3.870	4.182	4.503	5.189	5.862	6.579	6.948	7.318	8.077	8.853	10.05	10.88	11.27	12.95	15.09
20	2.158	2.399	2.654	2.921	3.199	3.487	3.785	4.092	4.408	5.062	5.743	6.450	6.812	7.178	7.927	8.694	9.873	10.68	11.08	12.74	14.87
21	2.110	2.347	2.598	2.858	3.131	3.413	3.705	4.007	4.316	4.959	5.630	6.326	6.682	7.044	7.783	8.540	9.705	10.50	10.90	12.54	14.65
22	2.068	2.298	2.542	2.798	3.065	3.342	3.629	3.925	4.229	4.861	5.521	6.207	6.559	6.915	7.644	8.392	9.543	10.33	10.73	12.35	14.44
23	2.025	2.251	2.490	2.741	3.003	3.275	3.558	3.847	4.146	4.767	5.417	6.093	6.437	6.792	7.511	8.249	9.387	10.16	10.56	12.17	14.24
24	1.985	2.207	2.441	2.687	2.944	3.211	3.487	3.773	4.068	4.678	5.318	5.983	6.325	6.67							

TABLE 7.- Z-PANEL PROPERTIES $\left(\frac{t}{W} = 0.79; \frac{b}{t} = 8.2; \frac{b}{W} = 0.4; \frac{d}{t} = 1.97; \frac{p}{t} = 6.38\right)$ - Concluded.

$\frac{h}{t}$	$\frac{b}{t}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	38	40	45
37		1.612	1.768	1.970	2.165	2.389	2.583	2.808	3.038	3.278	3.780	4.312	4.870	5.158	5.452	6.057	6.683	7.656	8.327	8.689	10.07	11.90
38		1.591	1.762	1.943	2.135	2.336	2.547	2.766	2.995	3.231	3.727	4.262	4.803	5.088	5.378	5.976	6.595	7.558	8.223	8.581	9.951	11.77
39		1.571	1.739	1.917	2.108	2.304	2.511	2.728	2.953	3.186	3.675	4.193	4.738	5.019	5.306	5.897	6.509	7.463	8.120	8.466	9.833	11.63
40		1.551	1.716	1.892	2.078	2.273	2.478	2.691	2.913	3.143	3.626	4.137	4.674	4.952	5.238	5.821	6.426	7.370	8.021	8.353	9.718	11.50
42		1.514	1.674	1.844	2.025	2.214	2.413	2.620	2.838	3.060	3.530	4.029	4.553	4.825	5.102	5.674	6.266	7.191	7.830	8.165	9.496	11.25
44		1.480	1.635	1.800	1.975	2.159	2.352	2.554	2.764	2.982	3.440	3.927	4.439	4.705	4.976	5.535	6.115	7.021	7.648	7.987	9.284	11.01
46		1.448	1.598	1.759	1.928	2.108	2.295	2.492	2.696	2.909	3.358	3.831	4.331	4.591	4.866	5.403	5.972	6.860	7.475	7.789	9.082	10.78
48		1.417	1.564	1.719	1.885	2.069	2.242	2.433	2.634	2.840	3.276	3.740	4.229	4.483	4.743	5.278	5.835	6.707	7.310	7.618	8.889	10.58
50		1.389	1.531	1.683	1.844	2.013	2.183	2.378	2.573	2.775	3.200	3.654	4.132	4.381	4.635	5.160	5.708	6.561	7.153	7.455	8.705	10.35
52	$\frac{h}{t}$	1.363	1.501	1.648	1.805	1.970	2.144	2.326	2.518	2.713	3.129	3.572	4.041	4.284	4.533	5.047	5.582	6.421	7.003	7.300	8.528	10.15
54		1.338	1.472	1.618	1.768	1.930	2.099	2.277	2.462	2.654	3.061	3.494	3.953	4.191	4.435	4.939	5.464	6.288	6.859	7.152	8.380	9.951
56		1.314	1.445	1.585	1.734	1.891	2.057	2.230	2.411	2.599	2.997	3.421	3.870	4.103	4.342	4.837	5.351	6.160	6.722	7.009	8.197	9.785
58		1.292	1.419	1.556	1.701	1.855	2.016	2.186	2.362	2.547	2.935	3.351	3.791	4.019	4.254	4.739	5.244	6.039	6.590	6.873	8.042	9.588
60		1.270	1.395	1.528	1.670	1.820	1.978	2.143	2.316	2.496	2.877	3.284	3.715	3.939	4.169	4.645	5.141	5.922	6.464	6.742	7.893	9.413
63		1.241	1.360	1.489	1.626	1.771	1.924	2.084	2.251	2.425	2.795	3.189	3.608	3.826	4.049	4.512	4.995	5.755	6.285	6.558	7.680	9.188
66		1.213	1.329	1.454	1.586	1.728	1.874	2.029	2.191	2.360	2.718	3.101	3.508	3.719	3.937	4.387	4.858	5.600	6.116	6.380	7.478	8.933
69		1.188	1.300	1.420	1.548	1.684	1.827	1.977	2.135	2.299	2.646	3.018	3.414	3.620	3.831	4.270	4.729	5.452	5.956	6.215	7.288	8.712
72		1.164	1.272	1.389	1.513	1.645	1.783	1.929	2.082	2.241	2.579	2.940	3.325	3.526	3.732	4.160	4.607	5.313	5.805	6.058	7.108	8.502
75		1.142	1.247	1.360	1.480	1.608	1.742	1.884	2.032	2.187	2.515	2.867	3.242	3.438	3.639	4.056	4.492	5.182	5.663	5.910	6.937	8.302
78		1.121	1.223	1.333	1.449	1.573	1.704	1.842	1.986	2.138	2.456	2.799	3.164	3.355	3.551	3.957	4.384	5.057	5.528	5.769	6.774	8.113
81		1.102	1.201	1.307	1.420	1.541	1.668	1.802	1.942	2.088	2.400	2.734	3.080	3.276	3.467	3.864	4.280	4.939	5.400	5.638	6.620	7.932
84		1.083	1.179	1.283	1.393	1.510	1.634	1.764	1.901	2.043	2.347	2.672	3.020	3.202	3.388	3.776	4.184	4.827	5.278	5.509	6.474	7.760
15	$\frac{b}{t}$	2.987	3.328	3.688	4.011	4.355	4.701	5.046	5.391	5.738	6.424	7.108	7.788	8.127	8.464	9.134	9.800	10.79	11.44	11.77	13.06	14.65
16		2.959	3.298	3.637	3.960	4.323	4.668	5.013	5.359	5.704	6.394	7.080	7.762	8.102	8.441	9.115	9.784	10.78	11.44	11.76	13.06	14.65
17		2.930	3.268	3.606	3.948	4.291	4.636	4.981	5.326	5.672	6.362	7.050	7.735	8.076	8.416	9.092	9.765	10.77	11.43	11.75	13.06	14.67
18		2.902	3.237	3.575	3.916	4.259	4.603	4.948	5.293	5.638	6.330	7.019	7.706	8.048	8.388	9.068	9.743	10.75	11.41	11.74	13.05	14.67
19		2.875	3.208	3.545	3.885	4.227	4.572	4.915	5.260	5.606	6.297	6.987	7.675	8.018	8.360	9.042	9.719	10.73	11.40	11.73	13.05	14.67
20		2.848	3.180	3.516	3.854	4.195	4.538	4.882	5.227	5.572	6.263	6.955	7.643	7.987	8.330	9.014	9.694	10.71	11.38	11.71	13.03	14.68
21		2.822	3.152	3.488	3.823	4.163	4.505	4.848	5.193	5.538	6.230	6.921	7.612	7.956	8.299	8.985	9.667	10.68	11.35	11.69	13.02	14.66
22		2.796	3.124	3.457	3.793	4.133	4.473	4.816	5.160	5.505	6.196	6.888	7.578	7.923	8.266	8.954	9.638	10.65	11.33	11.67	13.00	14.65
23		2.770	3.097	3.428	3.763	4.101	4.441	4.783	5.126	5.471	6.161	6.853	7.545	7.890	8.235	8.923	9.608	10.63	11.30	11.65	12.99	14.64
24		2.746	3.070	3.400	3.733	4.070	4.409	4.750	5.093	5.437	6.127	6.819	7.511	7.856	8.201	8.890	9.577	10.60	11.28	11.62	12.98	14.63
25		2.721	3.044	3.372	3.704	4.039	4.378	4.718	5.060	5.403	6.093	6.784	7.476	7.822	8.167	8.858	9.548	10.57	11.25	11.59	12.94	14.61
26		2.698	3.018	3.345	3.676	4.010	4.347	4.686	5.027	5.370	6.059	6.750	7.441	7.788	8.133	8.824	9.513	10.54	11.23	11.57	12.92	14.59
27		2.674	2.993	3.318	3.647	3.980	4.316	4.654	4.995	5.337	6.024	6.715	7.407	7.753	8.099	8.790	9.480	10.51	11.20	11.54	12.89	14.57
28		2.651	2.968	3.292	3.619	3.951	4.286	4.623	4.963	5.304	5.990	6.680	7.372	7.718	8.064	8.756	9.446	10.46	11.16	11.51	12.87	14.55
29		2.628	2.944	3.266	3.592	3.922	4.256	4.592	4.931	5.271	5.956	6.646	7.337	7.683	8.028	8.721	9.412	10.43	11.13	11.48	12.84	14.53
30		2.607	2.921	3.241	3.565	3.894	4.227	4.562	4.899	5.239	5.923	6.611	7.301	7.647	7.993	8.686	9.377	10.41	11.10	11.44	12.81	14.50
31		2.585	2.897	3.218	3.539	3.867	4.198	4.532	4.868	5.207	5.890	6.577	7.267	7.613	7.959	8.651	9.343	10.38	11.07	11.41	12.78	14.48
32		2.564	2.875	3.192	3.513	3.839	4.169	4.502	4.838	5.176	5.858	6.542	7.232	7.577	7.923	8.615	9.308	10.35	11.04	11.38	12.75	14.45
33		2.544	2.853	3.168	3.488	3.813	4.141	4.473	4.807	5.144	5.823	6.508	7.197	7.542	7.888	8.580	9.272	10.31	10.97	11.35	12.72	14.42
34		2.524	2.831	3.144	3.463	3.786	4.113	4.444	4.777	5.113	5.791	6.476	7.162	7.507	7.853	8.544	9.237	10.28	10.97	11.31	12.69	14.40
35		2.504	2.809	3.121	3.438	3.760	4.086	4.416	4.751	5.083	5.759	6.441	7.128	7.473	7.818	8.509	9.202	10.24	10.93	11.28	12.65	14.37
36		2.485	2.788	3.099	3.415	3.735	4.069	4.397	4.719	5.053	5.727	6.408	7.093	7.438	7.782	8.473	9.165	10.20	10.90	11.24	12.62	14.33
37		2.466	2.768	3.076	3.391	3.710	4.033	4.360	4.690	5.023	5.695	6.376	7.060	7.403	7.748	8.438	9.130	10.17	10.86	11.21	12.59	14.30
38		2.447	2.748	3.055	3.367	3.685	4.007	4.333	4.662	4.994	5.664	6.342	7.025	7.369	7.713	8.403	9.094	10.13	10.83	11.17	12.55	14.27
39		2.429	2.728	3.033	3.345	3.661	3.982	4.306	4.634	4.965	5.634	6.311	6.992	7.335	7.679	8.368	9.059	10.10	10.79	11.14	12.52	14.24
40		2.412	2.709	3.012	3.322	3.637	3.956	4.280	4.608	4.936	5.603	6.278	6.959	7.301	7.644	8.333	9.023	10.06	10.75	11.10	12.48	14.21
42		2.377	2.671	2.972	3.278	3.590	3.907	4.228	4.553	4.880	5.543	6.215	6.893	7.234	7.578	8.263	8.953	9.980	10.68	11.03	12.41	14.14
44		2.344	2.635	2.933	3.236	3.546	3.860	4.178	4.500	4.826	5.485	6.153	6.827	7.168	7.509	8.195	8.883	9.918	10.61	10.96	12.34	14.07
46		2.313	2.600	2.895	3.198	3.502	3.814	4.130	4.450	4.773	5.428	6.093	6.765	7.104	7.443	8.127	8.813	9.847	10.51	10.88	12.27	14.00
48		2.282	2.567	2.858	3.155	3.461	3.770	4.083	4.400	4.721	5.372	6.034	6.703	7.040	7.379	8.060	8.744	9.777	10.47	10.81	12.20	13.93
50		2.253	2.534	2.823	3.119	3.420	3.726	4.037	4.352	4.671	5.318	5.978	6.642	6.978	7.315	7.994						

TABLE 8.- Z-PANEL PROPERTIES $\left(\frac{t_w}{t_s} = 1.00; \frac{b_A}{b_W} = 6.7; \frac{b_F}{b_W} = 0.4; \frac{d}{t_s} = 1.90; \frac{p}{t_s} = 5.99\right)$

$\frac{b_W}{t_s}$	$\frac{b_W}{t_w}$	10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	38	40	45
15	1.5	2.390	2.473	2.557	2.640	2.723	2.807	2.890	2.973	3.057	3.140	3.223	3.307	3.390	3.473	3.557	3.640	3.723	3.807	3.890	3.973	4.057
16	1.6	2.294	2.381	2.469	2.556	2.644	2.731	2.819	2.906	2.994	3.081	3.169	3.256	3.344	3.431	3.519	3.606	3.694	3.781	3.869	3.956	4.044
17	1.7	2.218	2.300	2.382	2.465	2.547	2.629	2.712	2.794	2.877	2.959	3.041	3.123	3.206	3.288	3.371	3.453	3.535	3.617	3.699	3.781	3.863
18	1.8	2.150	2.228	2.306	2.383	2.461	2.539	2.617	2.694	2.772	2.849	2.926	3.003	3.080	3.157	3.234	3.311	3.388	3.465	3.542	3.619	3.696
19	1.9	2.090	2.163	2.237	2.311	2.384	2.458	2.532	2.605	2.679	2.752	2.826	2.899	2.972	3.045	3.118	3.191	3.264	3.337	3.410	3.483	3.556
20	2.0	2.035	2.105	2.175	2.245	2.315	2.385	2.455	2.525	2.595	2.665	2.735	2.805	2.875	2.945	3.015	3.085	3.155	3.225	3.295	3.365	3.435
21	2.1	1.986	2.052	2.119	2.186	2.252	2.319	2.386	2.452	2.519	2.586	2.652	2.719	2.786	2.852	2.919	2.986	3.052	3.119	3.186	3.252	3.319
22	2.2	1.941	2.005	2.068	2.132	2.196	2.259	2.323	2.386	2.450	2.513	2.577	2.640	2.703	2.767	2.830	2.893	2.956	3.019	3.082	3.145	3.208
23	2.3	1.900	1.961	2.022	2.083	2.144	2.204	2.265	2.326	2.386	2.447	2.507	2.568	2.628	2.688	2.748	2.808	2.868	2.928	2.988	3.048	3.108
24	2.4	1.863	1.921	1.979	2.038	2.096	2.154	2.213	2.271	2.329	2.388	2.446	2.504	2.562	2.620	2.678	2.736	2.794	2.852	2.910	2.968	3.026
25	2.5	1.828	1.884	1.940	1.996	2.052	2.108	2.164	2.220	2.276	2.332	2.388	2.444	2.500	2.556	2.612	2.668	2.724	2.780	2.836	2.892	2.948
26	2.6	1.796	1.850	1.904	1.957	2.012	2.065	2.118	2.173	2.227	2.281	2.335	2.389	2.443	2.497	2.551	2.605	2.659	2.713	2.767	2.821	2.875
27	2.7	1.767	1.819	1.870	1.922	1.974	2.026	2.078	2.130	2.182	2.234	2.286	2.338	2.390	2.442	2.494	2.546	2.598	2.650	2.702	2.754	2.806
28	2.8	1.739	1.789	1.839	1.889	1.939	1.989	2.039	2.089	2.139	2.189	2.239	2.289	2.339	2.389	2.439	2.489	2.539	2.589	2.639	2.689	2.739
29	2.9	1.714	1.763	1.810	1.859	1.907	1.955	2.003	2.052	2.100	2.147	2.195	2.243	2.291	2.339	2.387	2.435	2.483	2.531	2.579	2.627	2.675
30	3.0	1.690	1.737	1.783	1.830	1.877	1.923	1.970	2.017	2.063	2.109	2.156	2.202	2.249	2.295	2.342	2.388	2.435	2.481	2.528	2.574	2.621
31	3.1	1.668	1.713	1.758	1.803	1.848	1.894	1.939	1.984	2.029	2.074	2.119	2.164	2.209	2.254	2.300	2.345	2.390	2.435	2.480	2.525	2.570
32	3.2	1.647	1.691	1.735	1.779	1.822	1.866	1.909	1.953	1.997	2.041	2.084	2.128	2.172	2.216	2.260	2.304	2.348	2.392	2.436	2.480	2.524
33	3.3	1.627	1.670	1.712	1.755	1.797	1.839	1.882	1.924	1.967	2.009	2.052	2.094	2.137	2.179	2.222	2.265	2.308	2.351	2.394	2.437	2.480
34	3.4	1.609	1.650	1.691	1.732	1.774	1.815	1.856	1.897	1.938	1.979	2.020	2.061	2.102	2.143	2.184	2.225	2.266	2.307	2.348	2.389	2.430
35	3.5	1.591	1.631	1.671	1.711	1.751	1.791	1.831	1.871	1.911	1.951	1.991	2.031	2.071	2.111	2.151	2.191	2.231	2.271	2.311	2.351	2.391
36	3.6	1.575	1.614	1.653	1.692	1.731	1.769	1.808	1.847	1.886	1.924	1.963	2.002	2.041	2.080	2.119	2.158	2.197	2.236	2.275	2.314	2.353
37	3.7	1.560	1.597	1.635	1.673	1.711	1.749	1.787	1.824	1.862	1.900	1.938	1.976	2.014	2.052	2.090	2.128	2.166	2.204	2.242	2.280	2.318
38	3.8	1.545	1.582	1.618	1.655	1.692	1.729	1.766	1.803	1.840	1.877	1.914	1.951	1.988	2.025	2.062	2.099	2.136	2.173	2.210	2.247	2.284
39	3.9	1.531	1.567	1.603	1.639	1.674	1.710	1.746	1.782	1.818	1.854	1.890	1.926	1.962	1.998	2.034	2.070	2.106	2.142	2.178	2.214	2.250
40	4.0	1.518	1.553	1.588	1.623	1.658	1.693	1.728	1.763	1.798	1.833	1.868	1.903	1.938	1.973	2.008	2.043	2.078	2.113	2.148	2.183	2.218
42	4.2	1.493	1.528	1.560	1.593	1.626	1.660	1.693	1.726	1.760	1.793	1.826	1.859	1.892	1.925	1.958	1.991	2.024	2.057	2.090	2.123	2.156
44	4.4	1.471	1.502	1.534	1.566	1.598	1.630	1.661	1.693	1.725	1.757	1.789	1.821	1.853	1.885	1.917	1.949	1.981	2.013	2.045	2.077	2.109
46	4.6	1.450	1.480	1.511	1.541	1.572	1.602	1.633	1.663	1.694	1.724	1.754	1.784	1.814	1.844	1.874	1.904	1.934	1.964	1.994	2.024	2.054
48	4.8	1.431	1.460	1.490	1.519	1.548	1.577	1.606	1.635	1.665	1.694	1.723	1.752	1.781	1.810	1.839	1.868	1.897	1.926	1.955	1.984	2.013
50	5.0	1.414	1.442	1.470	1.498	1.526	1.554	1.582	1.610	1.638	1.666	1.694	1.722	1.750	1.778	1.806	1.834	1.862	1.890	1.918	1.946	1.974
52	5.2	1.398	1.425	1.452	1.479	1.506	1.533	1.560	1.587	1.614	1.641	1.667	1.694	1.721	1.748	1.775	1.802	1.829	1.856	1.883	1.910	1.937
54	5.4	1.384	1.409	1.435	1.461	1.487	1.513	1.539	1.565	1.591	1.617	1.643	1.669	1.695	1.721	1.747	1.773	1.799	1.825	1.851	1.877	1.903
56	5.6	1.369	1.395	1.420	1.445	1.470	1.495	1.520	1.545	1.570	1.595	1.620	1.645	1.670	1.695	1.720	1.745	1.770	1.795	1.820	1.845	1.870
58	5.8	1.357	1.381	1.405	1.429	1.453	1.478	1.502	1.526	1.550	1.574	1.598	1.622	1.646	1.670	1.694	1.718	1.742	1.766	1.790	1.814	1.838
60	6.0	1.345	1.368	1.392	1.415	1.438	1.462	1.485	1.508	1.532	1.555	1.578	1.602	1.625	1.648	1.672	1.695	1.718	1.742	1.765	1.788	1.812
62	6.2	1.329	1.351	1.373	1.395	1.418	1.440	1.462	1.484	1.506	1.528	1.551	1.573	1.595	1.617	1.639	1.661	1.683	1.705	1.727	1.749	1.771
64	6.4	1.314	1.335	1.356	1.377	1.399	1.420	1.441	1.462	1.483	1.504	1.525	1.546	1.567	1.588	1.609	1.630	1.651	1.672	1.693	1.714	1.735
66	6.6	1.300	1.320	1.341	1.361	1.381	1.401	1.422	1.442	1.462	1.482	1.503	1.523	1.544	1.564	1.584	1.604	1.625	1.645	1.665	1.685	1.705
68	6.8	1.288	1.307	1.326	1.345	1.365	1.385	1.404	1.424	1.443	1.463	1.482	1.501	1.521	1.540	1.560	1.579	1.599	1.618	1.638	1.657	1.677
70	7.0	1.276	1.295	1.313	1.332	1.351	1.369	1.388	1.407	1.425	1.443	1.462	1.481	1.500	1.519	1.537	1.556	1.575	1.594	1.613	1.632	1.651
72	7.2	1.265	1.283	1.301	1.319	1.337	1.355	1.373	1.391	1.409	1.426	1.444	1.462	1.480	1.498	1.516	1.534	1.552	1.570	1.588	1.606	1.624
74	7.4	1.258	1.273	1.289	1.307	1.325	1.342	1.359	1.377	1.394	1.412	1.429	1.446	1.463	1.480	1.497	1.514	1.531	1.548	1.565	1.582	1.599
76	7.6	1.246	1.263	1.280	1.296	1.313	1.330	1.346	1.363	1.380	1.413	1.446	1.480	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498	1.498
15	1.5	3.601	4.031	4.477	4.936	5.408	5.891	6.394	6.897	7.398	8.442	9.511	10.60	11.16	11.71	12.84	13.98	15.71	16.88	17.47	19.84	22.84
16	1.6	3.516	3.938	4.378	4.828	5.292	5.768	6.254	6.749	7.264	8.285	9.343	10.42	10.97	11.52	12.64	13.77	15.49	16.65	17.24	19.59	22.58
17	1.7	3.436	3.850	4.280	4.724	5.181	5.650	6.129	6.618	7.116	8.134	9.181	10.25	10.79	11.34	12.45	13.57	15.28	16.43	17.01	19.35	22.32
18	1.8	3.361	3.767	4.189	4.628	5.076	5.537	6.010	6.492	6.983	7.990	9.024	10.08	10.62	11.16	12.28	13.37	15.07	16.22	16.79	19.12	22.08
19	1.9	3.288	3.687	4.102	4.532	4.976	5.429	5.895	6.371	6.856	7.850	8.873	9.922	10.45	10.99	12.08	13.18	14.87	16.00	16.58	18.89	21.83
20	2.0	3.220	3.612	4.020	4.442	4.878	5.326	5.785	6.255	6.733	7.716	8.728	9.785	10.29	10.82	11.90	13.00	14.67	15.80	16.37	18.67	21.69
21	2.1	3.155	3.539	3.941	4.356	4.785	5.227	5.680	6.143	6.615	7.588	8.587	9.614	10.14	10.68	11.73	12.82	14.48	15.60	16.17	18.45	21.38
22	2.2	3.093	3.471	3.865	4.274	4.697	5.132	5.578	6.035	6.502	7.461	8.451	9.468	9.985	10.51	11.57	12.65	14.29	15			

TABLE 8.- Z-PANEL PROPERTIES $\left(\frac{t_w}{t_s} = 1.00; \frac{b_A}{t_w} = 6.7; \frac{b_F}{b_W} = 0.4; \frac{d}{t_s} = 1.90; \frac{p}{t_s} = 5.99\right)$ - Concluded.

$\frac{b_W}{t_W}$	$\frac{b_W}{t_W}$																					
		10	11	12	13	14	15	16	17	18	20	22	24	25	26	28	30	33	35	38	40	45
$\frac{h}{t_s}$	37	2.419	2.717	3.031	3.359	3.702	4.058	4.426	4.805	5.195	6.005	6.850	7.728	8.177	8.634	9.565	10.52	11.99	12.99	13.50	15.57	18.23
	38	2.388	2.680	2.990	3.314	3.652	4.004	4.387	4.742	5.128	5.929	6.766	7.638	8.081	8.533	9.457	10.40	11.88	12.86	13.37	15.42	18.07
	39	2.354	2.644	2.950	3.270	3.604	3.951	4.311	4.681	5.063	5.856	6.684	7.546	7.987	8.436	9.352	10.29	11.74	12.73	13.23	15.28	17.91
	40	2.324	2.610	2.911	3.227	3.557	3.900	4.256	4.622	4.999	5.784	6.605	7.458	7.895	8.340	9.249	10.19	11.62	12.60	13.10	15.13	17.75
	42	2.286	2.544	2.838	3.148	3.468	3.803	4.150	4.508	4.878	5.645	6.451	7.289	7.719	8.156	9.049	9.968	11.39	12.35	12.85	14.85	17.44
	44	2.211	2.482	2.768	3.069	3.383	3.711	4.050	4.401	4.762	5.515	6.305	7.128	7.550	7.980	8.859	9.763	11.16	12.12	12.60	14.58	17.14
	46	2.160	2.424	2.703	2.997	3.304	3.623	3.955	4.299	4.653	5.391	6.166	6.974	7.389	7.812	8.677	9.568	10.95	11.89	12.38	14.32	16.85
	48	2.111	2.369	2.641	2.928	3.228	3.541	3.868	4.202	4.549	5.273	6.033	6.827	7.236	7.652	8.503	9.380	10.74	11.67	12.14	14.07	16.58
	50	2.068	2.317	2.583	2.863	3.157	3.463	3.780	4.110	4.450	5.160	5.907	6.687	7.089	7.498	8.338	9.200	10.54	11.46	11.92	13.83	16.31
	52	2.023	2.268	2.528	2.802	3.089	3.388	3.700	4.023	4.358	5.053	5.788	6.553	6.948	7.351	8.176	9.027	10.35	11.25	11.71	13.60	16.05
$\frac{h}{t_s}$	54	1.982	2.221	2.476	2.743	3.024	3.318	3.623	3.939	4.268	4.950	5.671	6.426	6.813	7.210	8.023	8.861	10.16	11.06	11.51	13.38	15.80
	56	1.943	2.177	2.428	2.688	2.963	3.250	3.549	3.860	4.180	4.852	5.560	6.032	6.384	6.704	7.676	8.702	9.986	10.87	11.32	13.16	15.55
	58	1.907	2.136	2.379	2.635	2.904	3.186	3.479	3.784	4.098	4.758	5.454	6.184	6.560	6.944	7.733	8.548	9.815	10.69	11.13	12.95	15.32
	60	1.872	2.098	2.334	2.585	2.849	3.126	3.413	3.711	4.020	4.668	5.352	6.070	6.441	6.819	7.594	8.400	9.650	10.51	10.95	12.75	15.09
	63	1.823	2.039	2.270	2.514	2.770	3.038	3.318	3.608	3.909	4.540	5.207	5.909	6.271	6.640	7.401	8.188	9.413	10.28	10.68	12.45	14.78
	66	1.777	1.987	2.211	2.447	2.698	2.957	3.229	3.512	3.804	4.420	5.071	5.758	6.110	6.472	7.216	7.987	9.188	10.02	10.44	12.18	14.44
	69	1.734	1.938	2.155	2.385	2.627	2.881	3.145	3.421	3.708	4.308	4.942	5.612	5.958	6.312	7.041	7.798	8.974	9.788	10.20	11.91	14.14
	72	1.695	1.892	2.103	2.327	2.562	2.809	3.067	3.335	3.614	4.199	4.821	5.475	5.814	6.160	6.874	7.614	8.771	9.570	9.977	11.68	13.85
	75	1.657	1.849	2.054	2.272	2.501	2.742	2.993	3.255	3.528	4.098	4.705	5.346	5.677	6.017	6.716	7.442	8.577	9.361	9.762	11.41	13.58
	78	1.622	1.809	2.008	2.220	2.443	2.678	2.923	3.178	3.444	4.002	4.598	5.223	5.548	5.880	6.565	7.277	8.392	9.163	9.558	11.18	13.31
81	1.589	1.771	1.965	2.171	2.389	2.618	2.857	3.106	3.365	3.911	4.492	5.106	5.424	5.750	6.422	7.121	8.215	8.973	9.360	10.96	13.06	
84	1.557	1.735	1.924	2.125	2.338	2.561	2.795	3.038	3.291	3.825	4.394	4.995	5.307	5.626	6.285	6.971	8.045	8.791	9.171	10.74	12.81	
$\frac{h}{t_s}$	15	4.063	4.489	4.934	5.389	5.900	6.231	6.659	7.084	7.507	8.347	9.177	9.997	10.40	10.81	11.61	12.41	13.59	14.36	14.75	16.28	18.17
	16	4.040	4.476	4.912	5.346	5.780	6.211	6.641	7.069	7.494	8.338	9.172	9.997	10.41	10.81	11.62	12.42	13.61	14.39	14.78	16.32	18.22
	17	4.015	4.452	4.888	5.324	5.758	6.191	6.622	7.051	7.478	8.326	9.165	9.995	10.41	10.82	11.63	12.43	13.63	14.42	14.81	16.36	18.27
	18	3.991	4.427	4.864	5.300	5.735	6.169	6.602	7.032	7.461	8.312	9.155	9.989	10.40	10.81	11.63	12.44	13.64	14.44	14.83	16.39	18.31
	19	3.968	4.402	4.839	5.276	5.712	6.146	6.580	7.012	7.442	8.297	9.143	9.981	10.40	10.81	11.63	12.45	13.66	14.45	14.85	16.42	18.35
	20	3.941	4.377	4.813	5.250	5.687	6.123	6.557	6.990	7.422	8.279	9.129	9.971	10.39	10.80	11.63	12.45	13.66	14.47	14.86	16.44	18.39
	21	3.916	4.351	4.788	5.225	5.662	6.098	6.533	6.968	7.400	8.260	9.113	9.959	10.38	10.80	11.63	12.45	13.67	14.48	14.88	16.46	18.42
	22	3.891	4.325	4.762	5.199	5.638	6.073	6.509	6.944	7.378	8.240	9.098	9.945	10.37	10.79	11.62	12.45	13.67	14.48	14.89	16.48	18.44
	23	3.866	4.299	4.736	5.173	5.610	6.047	6.484	6.920	7.353	8.219	9.078	9.929	10.35	10.77	11.61	12.44	13.67	14.49	14.89	16.49	18.47
	24	3.841	4.274	4.710	5.146	5.584	6.021	6.458	6.895	7.330	8.197	9.058	9.912	10.34	10.76	11.60	12.43	13.67	14.49	14.89	16.51	18.49
$\frac{h}{t_s}$	25	3.816	4.248	4.683	5.120	5.557	5.995	6.432	6.869	7.305	8.174	9.037	9.894	10.32	10.74	11.59	12.42	13.67	14.49	14.90	16.51	18.51
	26	3.791	4.223	4.652	5.093	5.531	5.968	6.406	6.843	7.280	8.150	9.015	9.874	10.30	10.73	11.57	12.41	13.68	14.49	14.90	16.52	18.52
	27	3.767	4.197	4.631	5.067	5.504	5.941	6.379	6.817	7.254	8.125	8.992	9.853	10.28	10.71	11.55	12.40	13.65	14.48	14.89	16.52	18.53
	28	3.743	4.172	4.605	5.040	5.477	5.914	6.352	6.790	7.227	8.100	8.968	9.832	10.26	10.69	11.54	12.39	13.64	14.47	14.89	16.53	18.54
	29	3.719	4.147	4.580	5.014	5.450	5.887	6.325	6.763	7.200	8.074	8.944	9.809	10.24	10.67	11.52	12.37	13.63	14.47	14.88	16.53	18.55
	30	3.695	4.122	4.554	4.987	5.423	5.860	6.298	6.736	7.173	8.048	8.919	9.788	10.23	10.65	11.50	12.35	13.62	14.46	14.87	16.52	18.56
	31	3.672	4.098	4.528	4.961	5.396	5.833	6.270	6.708	7.146	8.021	8.894	9.762	10.19	10.63	11.48	12.34	13.61	14.45	14.86	16.52	18.56
	32	3.649	4.074	4.503	4.935	5.370	5.806	6.243	6.681	7.119	7.994	8.868	9.737	10.17	10.60	11.46	12.32	13.59	14.43	14.85	16.51	18.56
	33	3.626	4.050	4.478	4.909	5.343	5.779	6.216	6.653	7.091	7.967	8.841	9.712	10.15	10.58	11.44	12.30	13.57	14.42	14.84	16.51	18.56
	34	3.603	4.026	4.453	4.883	5.317	5.752	6.188	6.626	7.064	7.940	8.815	9.687	10.12	10.55	11.42	12.28	13.56	14.40	14.82	16.50	18.56
$\frac{h}{t_s}$	35	3.581	4.002	4.428	4.858	5.290	5.725	6.161	6.598	7.036	7.912	8.788	9.660	10.10	10.53	11.39	12.26	13.54	14.39	14.81	16.49	18.55
	36	3.559	3.979	4.404	4.833	5.264	5.698	6.134	6.571	7.009	7.885	8.760	9.634	10.07	10.50	11.37	12.23	13.52	14.37	14.79	16.47	18.55
	37	3.538	3.958	4.380	4.808	5.239	5.672	6.107	6.544	6.981	7.857	8.733	9.607	10.04	10.48	11.35	12.21	13.50	14.35	14.78	16.46	18.54
	38	3.516	3.933	4.355	4.783	5.213	5.646	6.080	6.516	6.953	7.829	8.705	9.580	10.02	10.45	11.32	12.19	13.48	14.33	14.76	16.45	18.53
	39	3.495	3.911	4.332	4.758	5.187	5.619	6.053	6.489	6.926	7.801	8.678	9.553	9.990	10.43	11.30	12.16	13.46	14.31	14.74	16.43	18.52
	40	3.475	3.889	4.309	4.734	5.162	5.593	6.027	6.462	6.898	7.773	8.650	9.525	9.963	10.40	11.27	12.14	13.43	14.29	14.72	16.42	18.51
	42	3.434	3.846	4.263	4.688	5.111	5.542	5.974	6.408	6.843	7.718	8.594	9.470	9.908								



Figure 1.- Test specimen with a large proportion of material in the stiffeners.

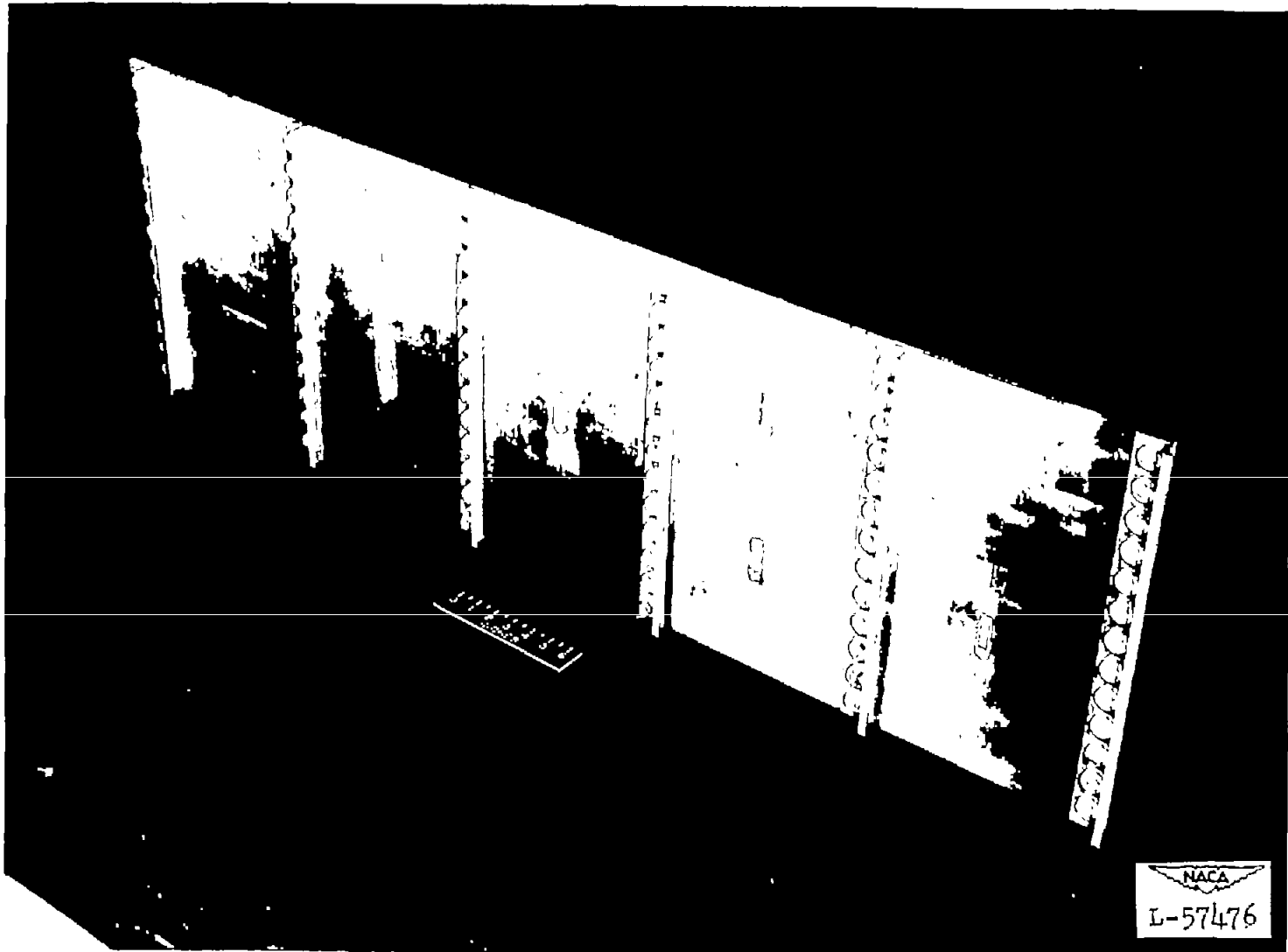


Figure 2.- Test specimen with a small proportion of material in stiffeners.

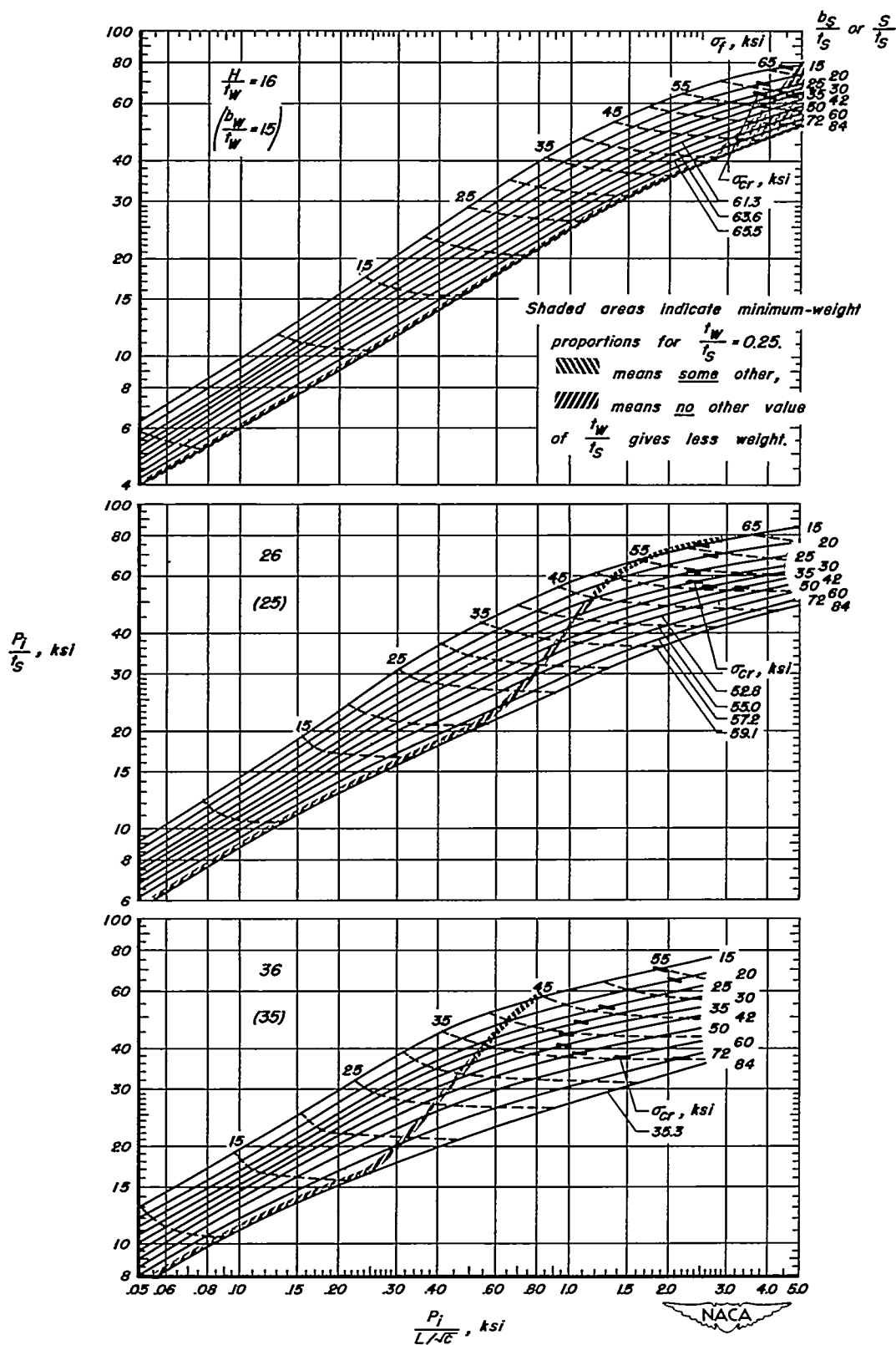


Figure 4.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_W}{t_S} = 0.25$.

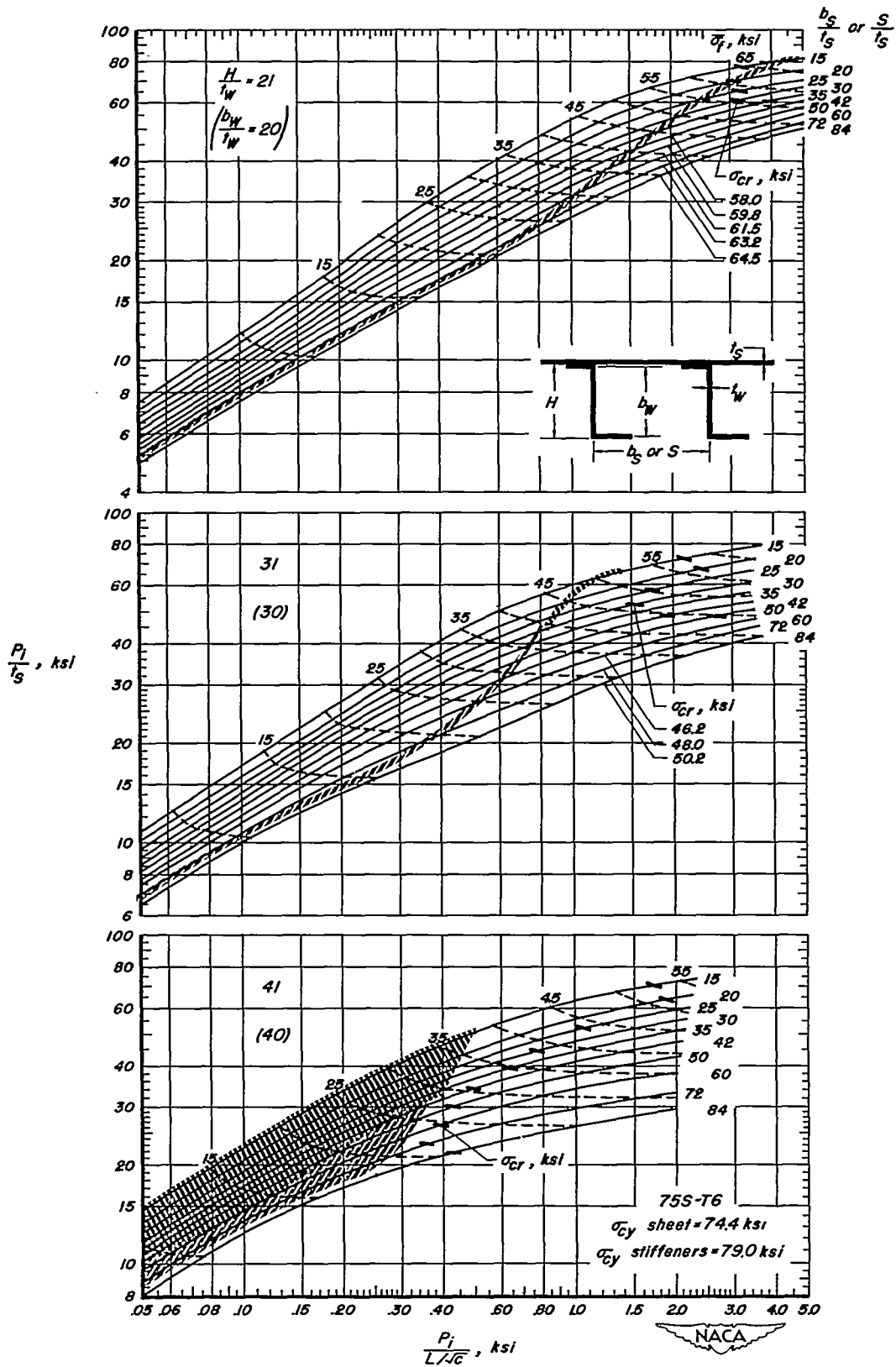


Figure 4.—Concluded. ($t_w/t_s = 0.25$)

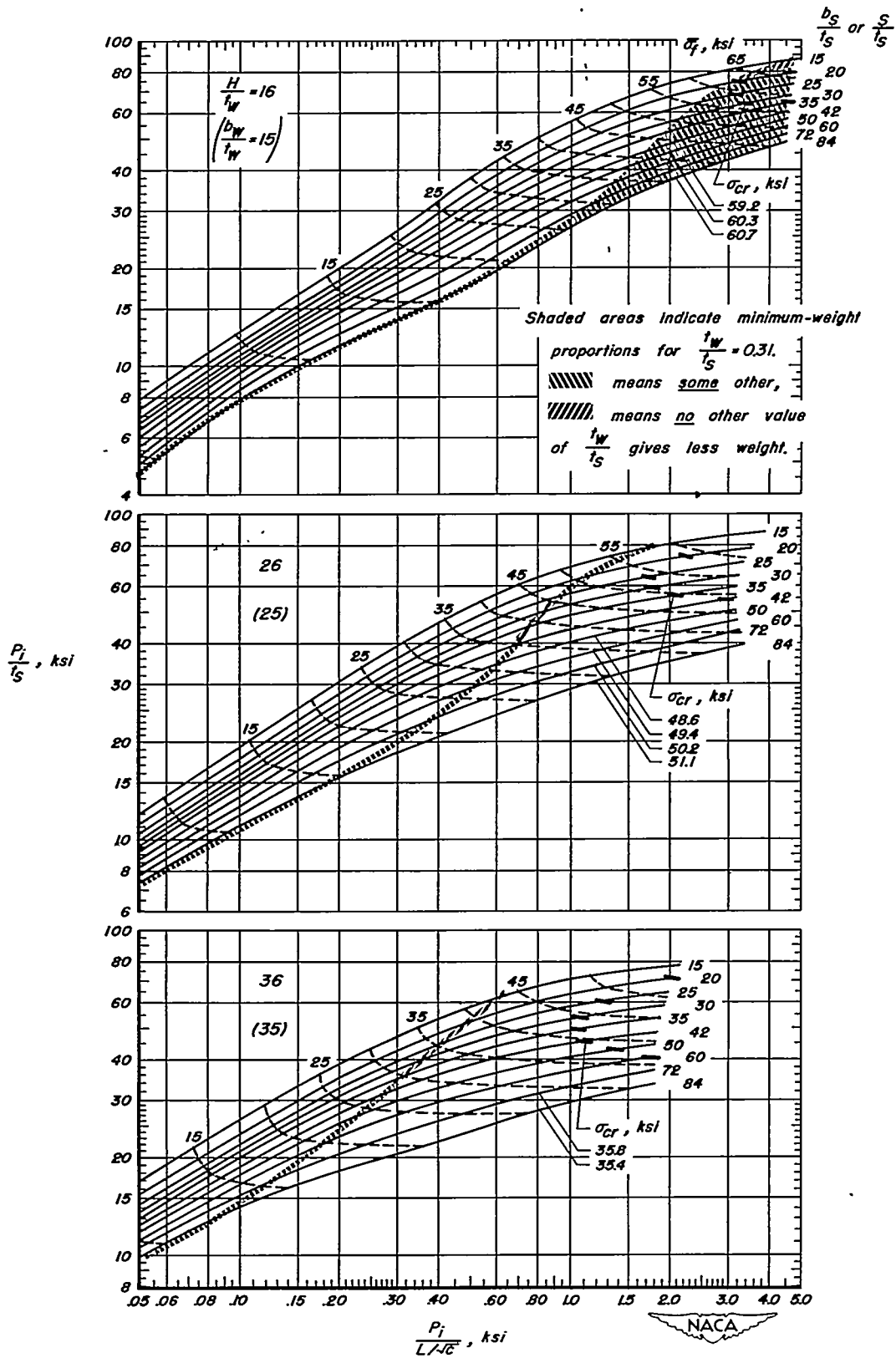
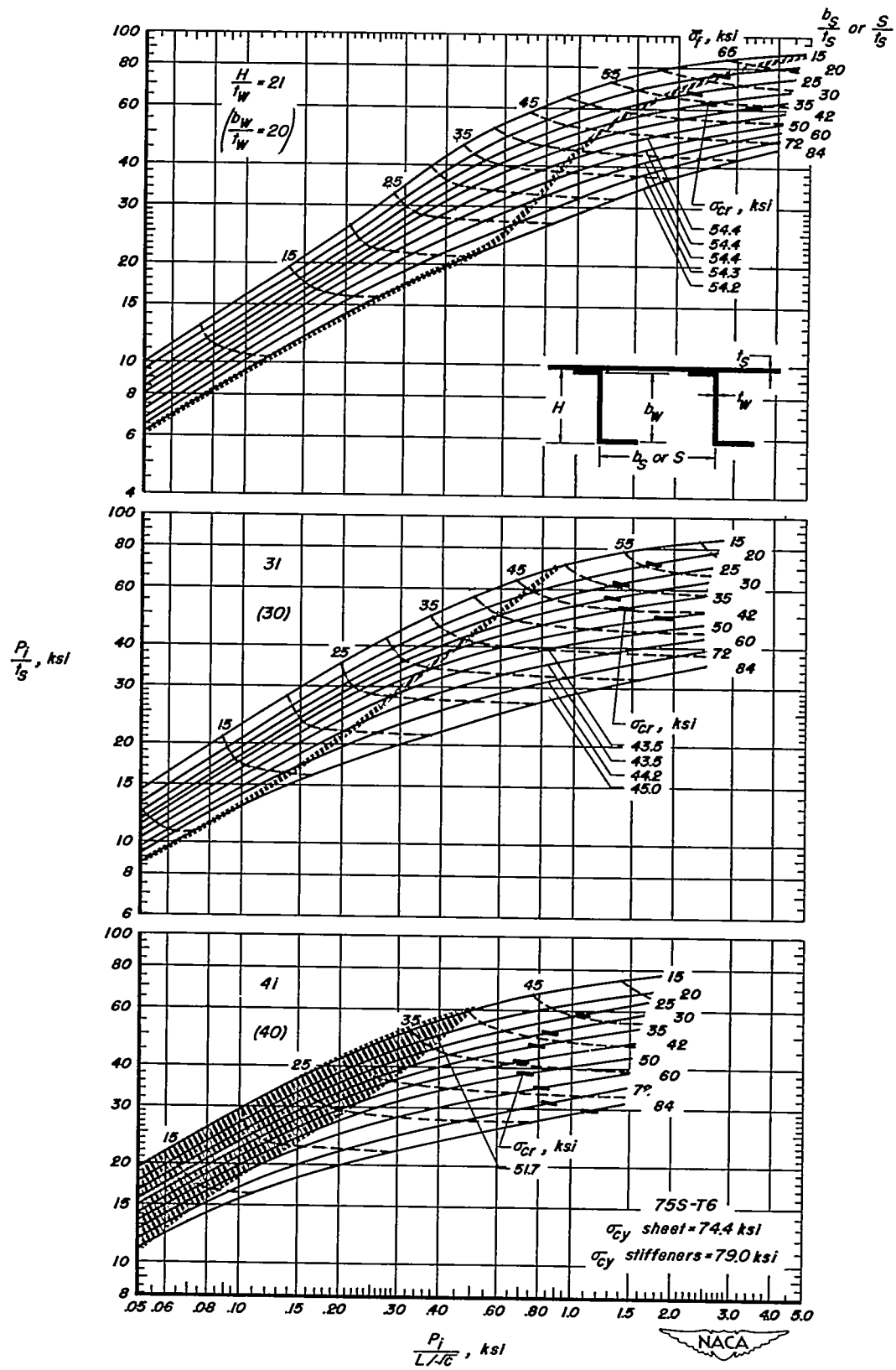


Figure 5.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.31$.

Figure 5.—Concluded. $\left(\frac{I_W}{I_S} = 0.31\right)$

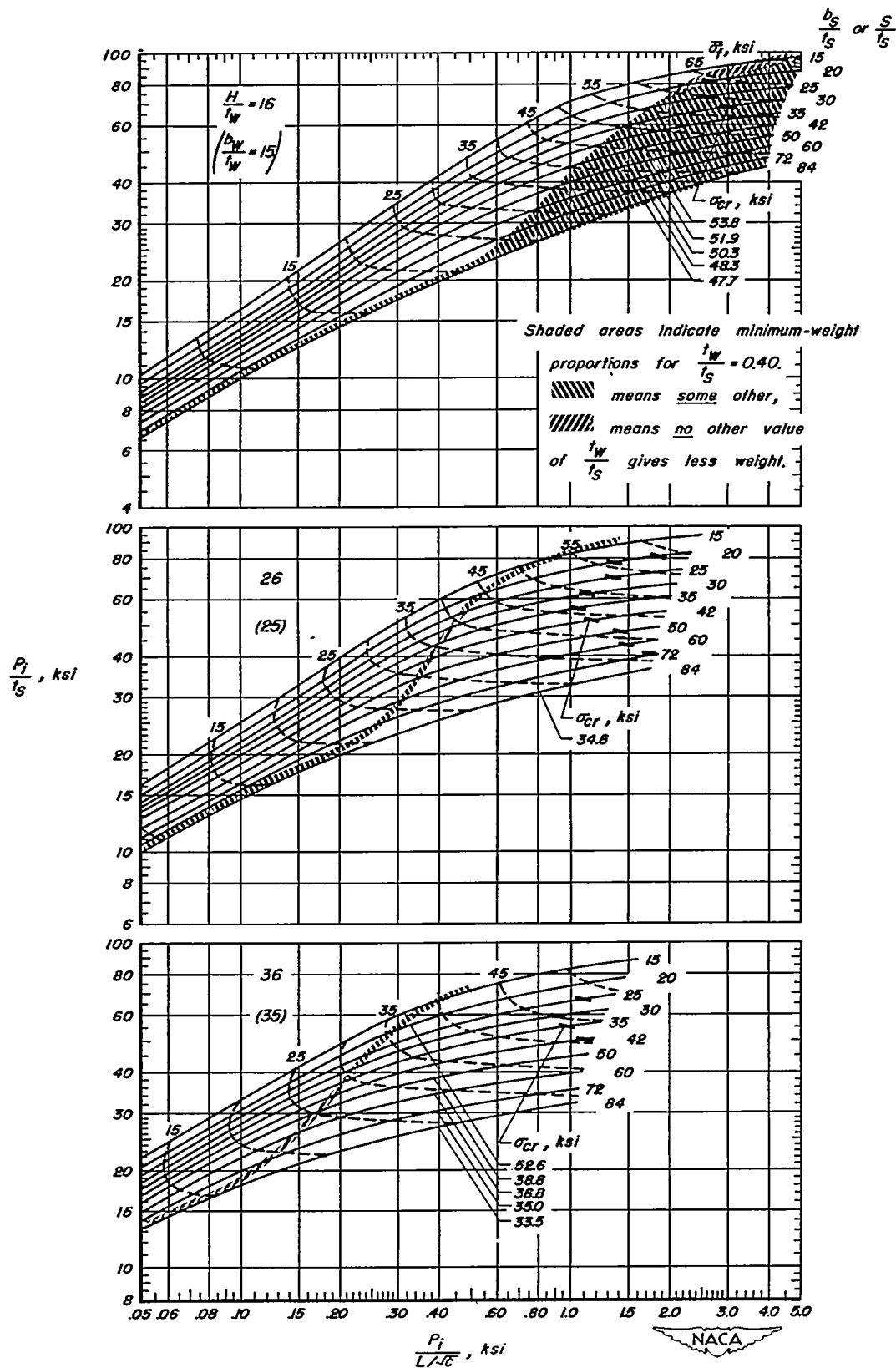
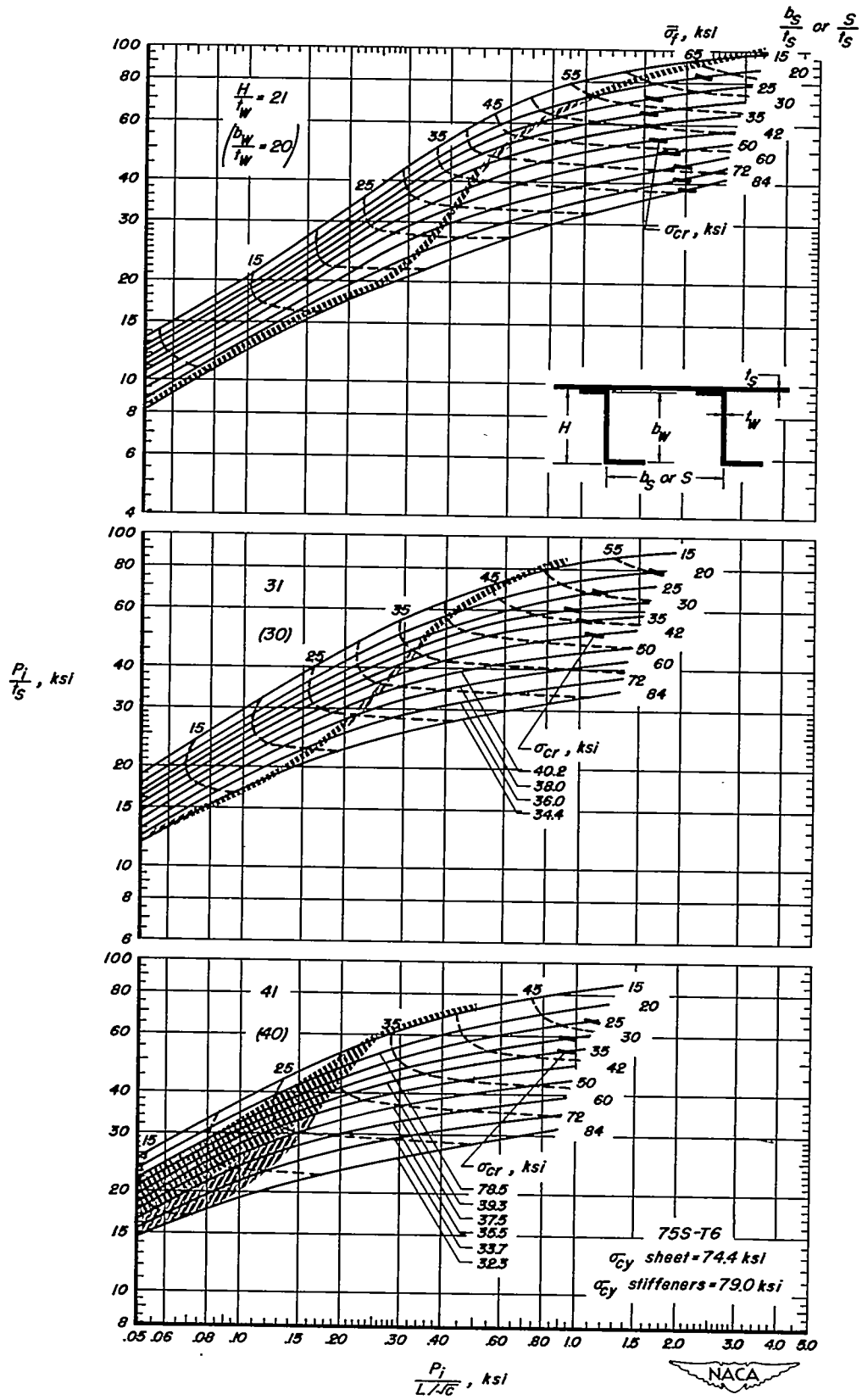


Figure 6.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $t_w/t_s = 0.40$.

Figure 6.—Concluded, $(\frac{t_w}{t_s} = 0.40)$

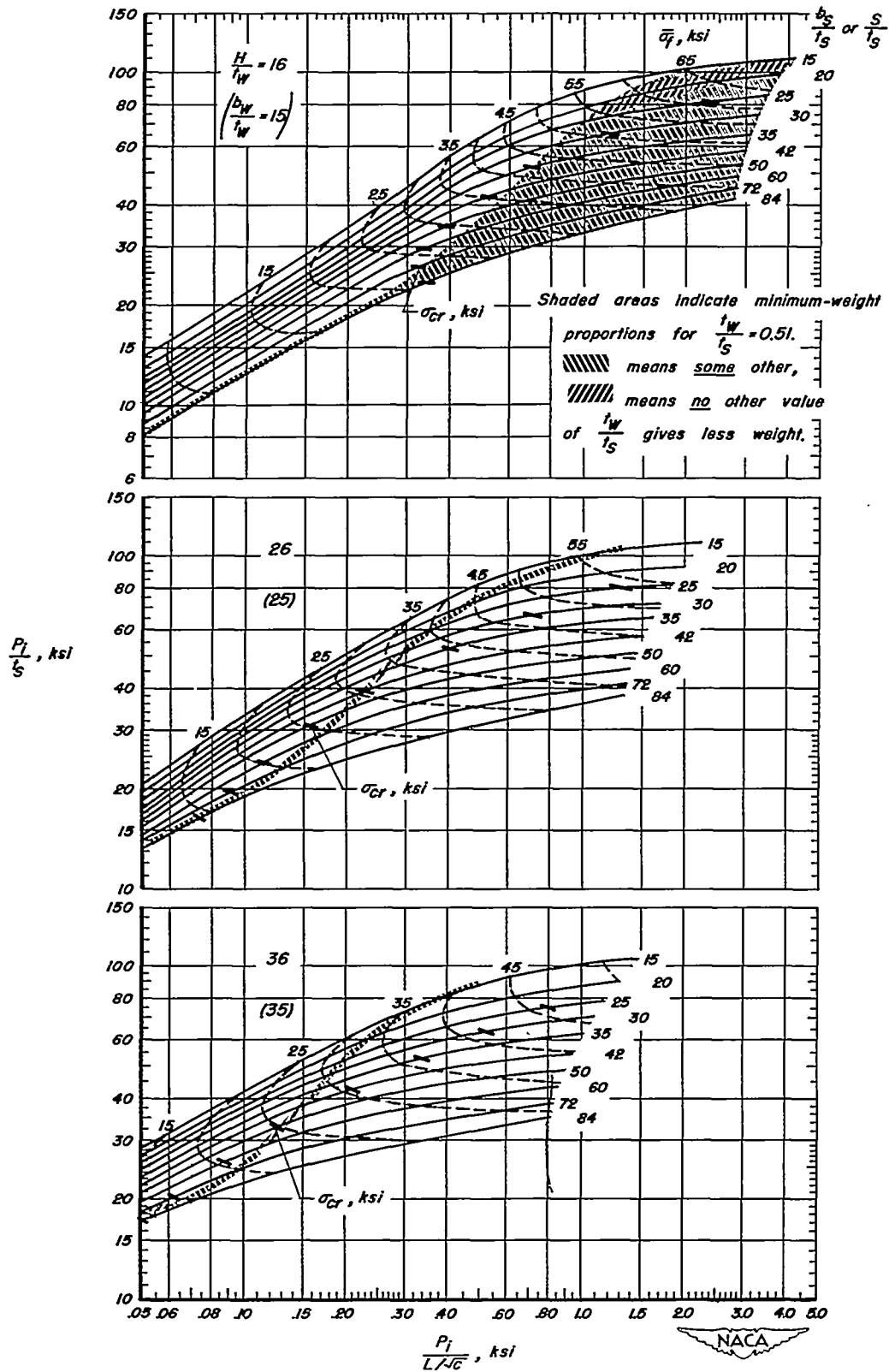
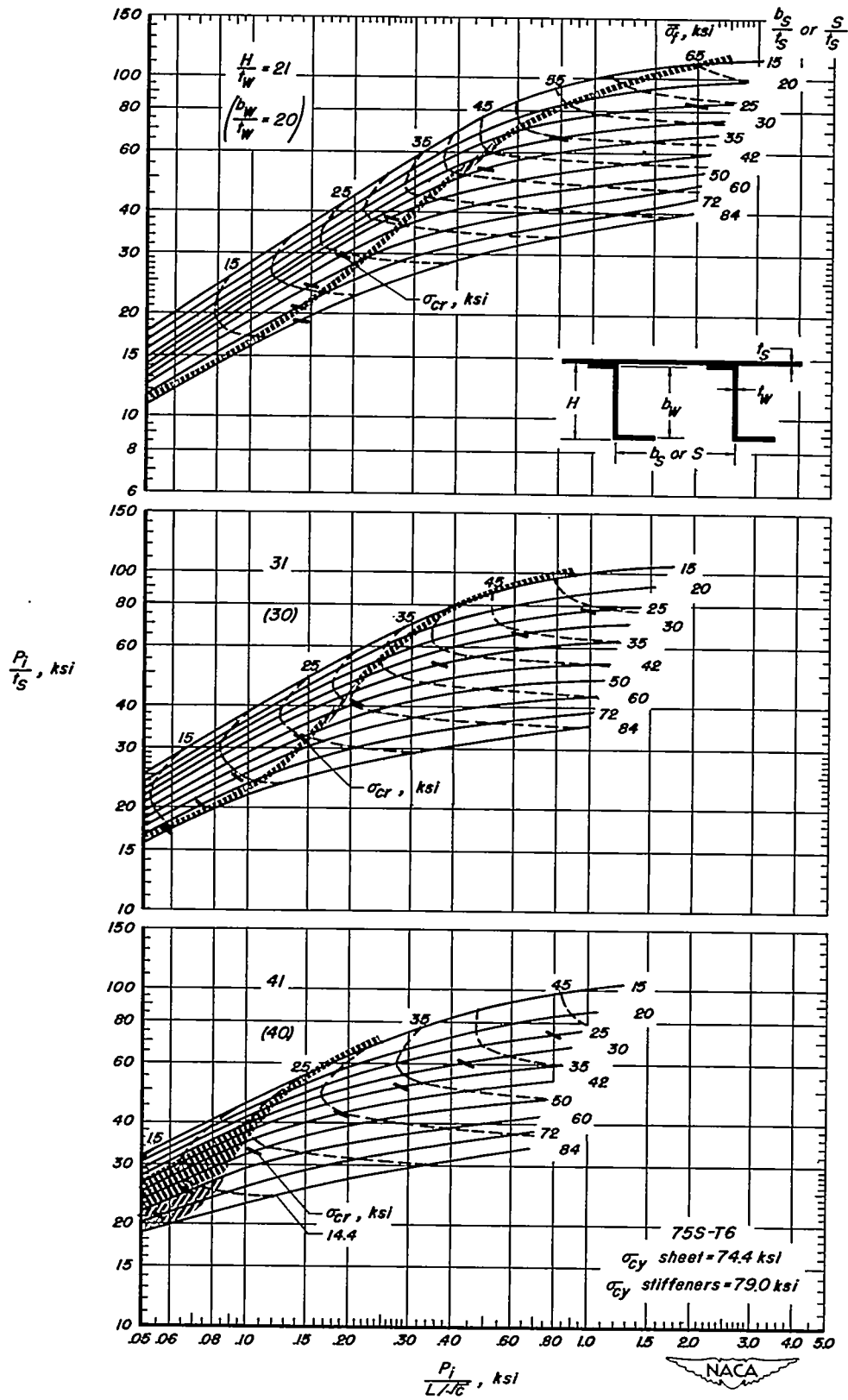


Figure 7.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_W}{t_S} = 0.51$.

Figure 7.—Concluded. $(t_W/t_S = 0.51)$

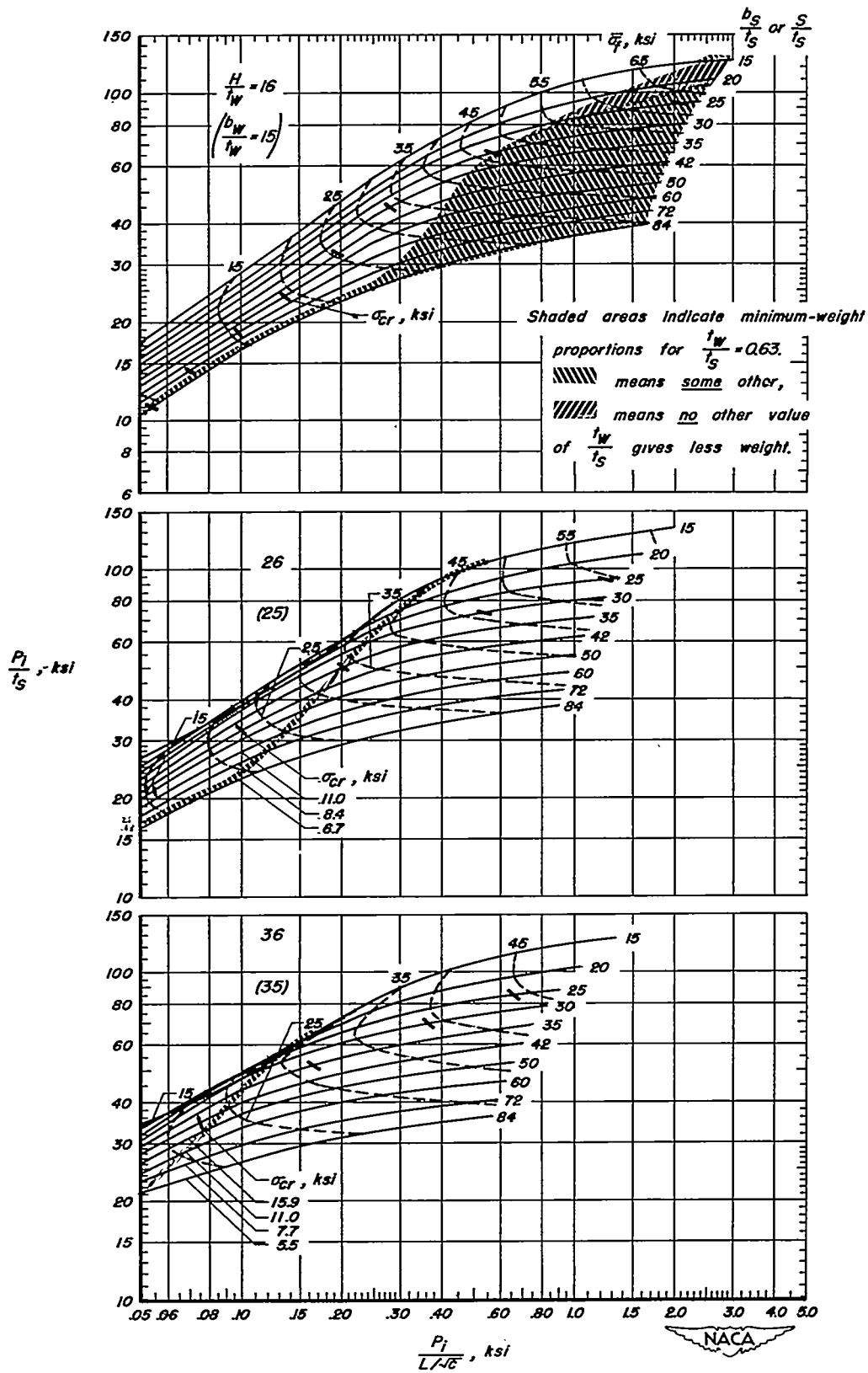
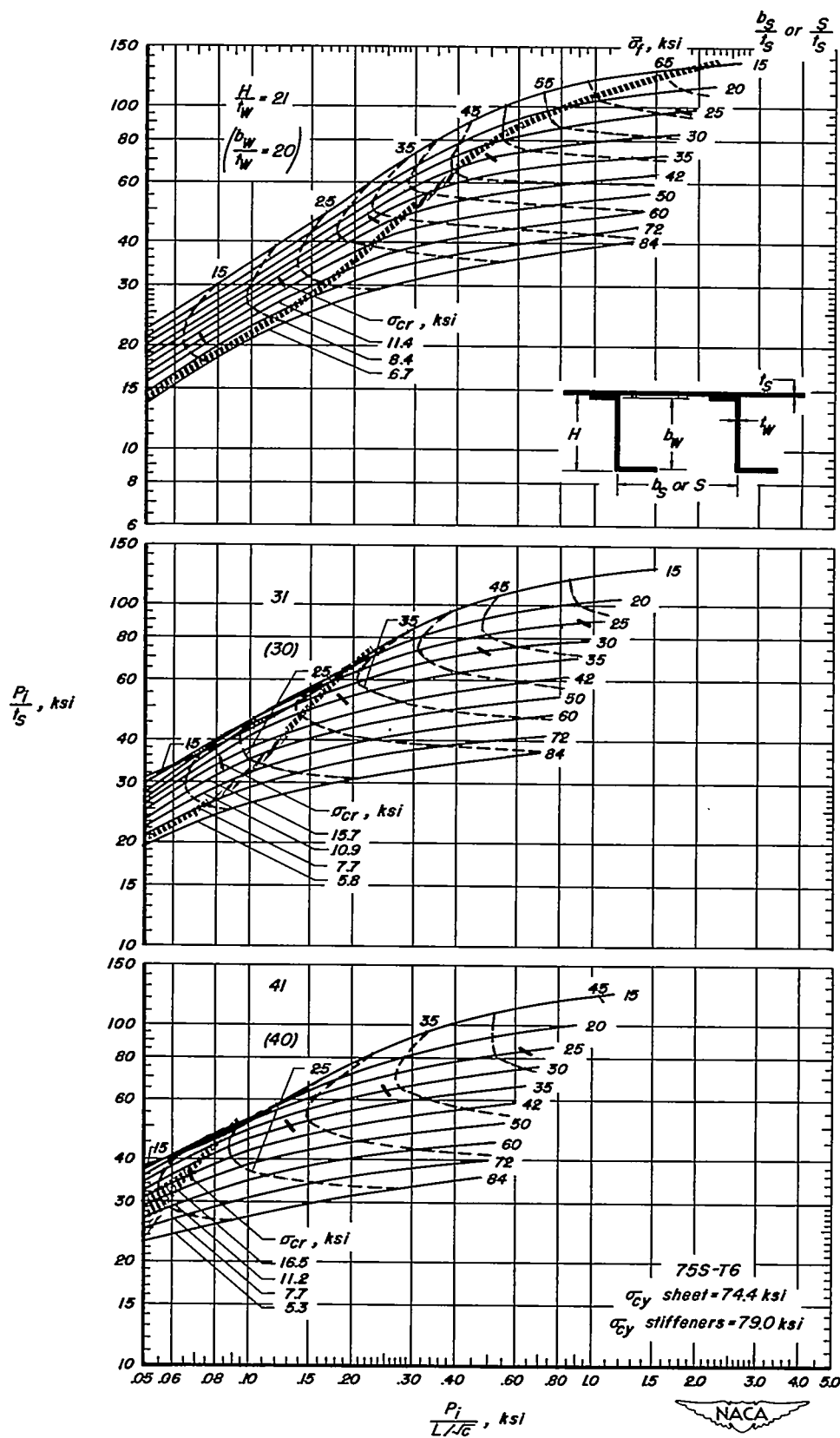


Figure 8.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.63$.

Figure 8.—Concluded, $\left(\frac{t_w}{t_s} = 0.63\right)$

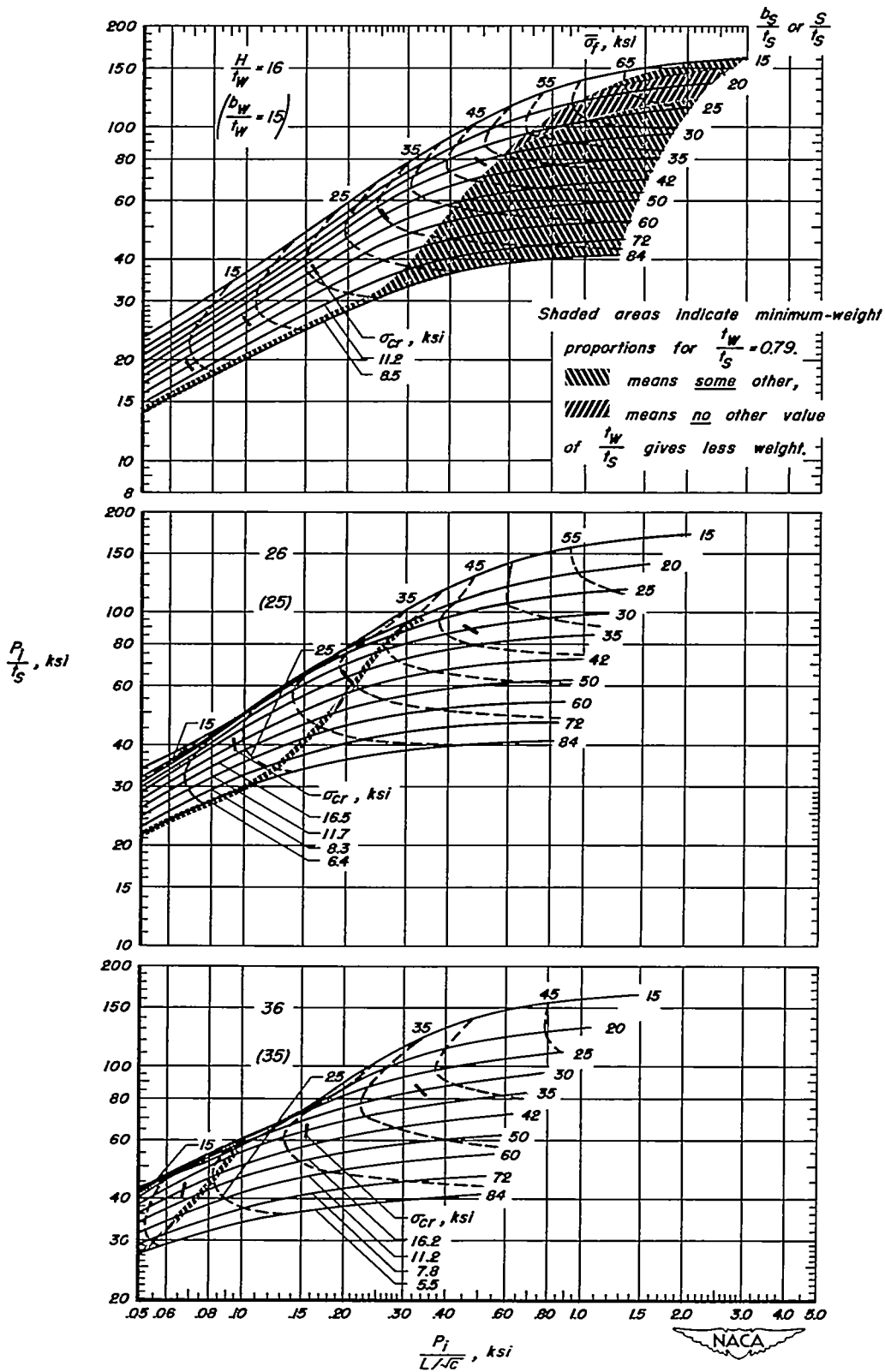
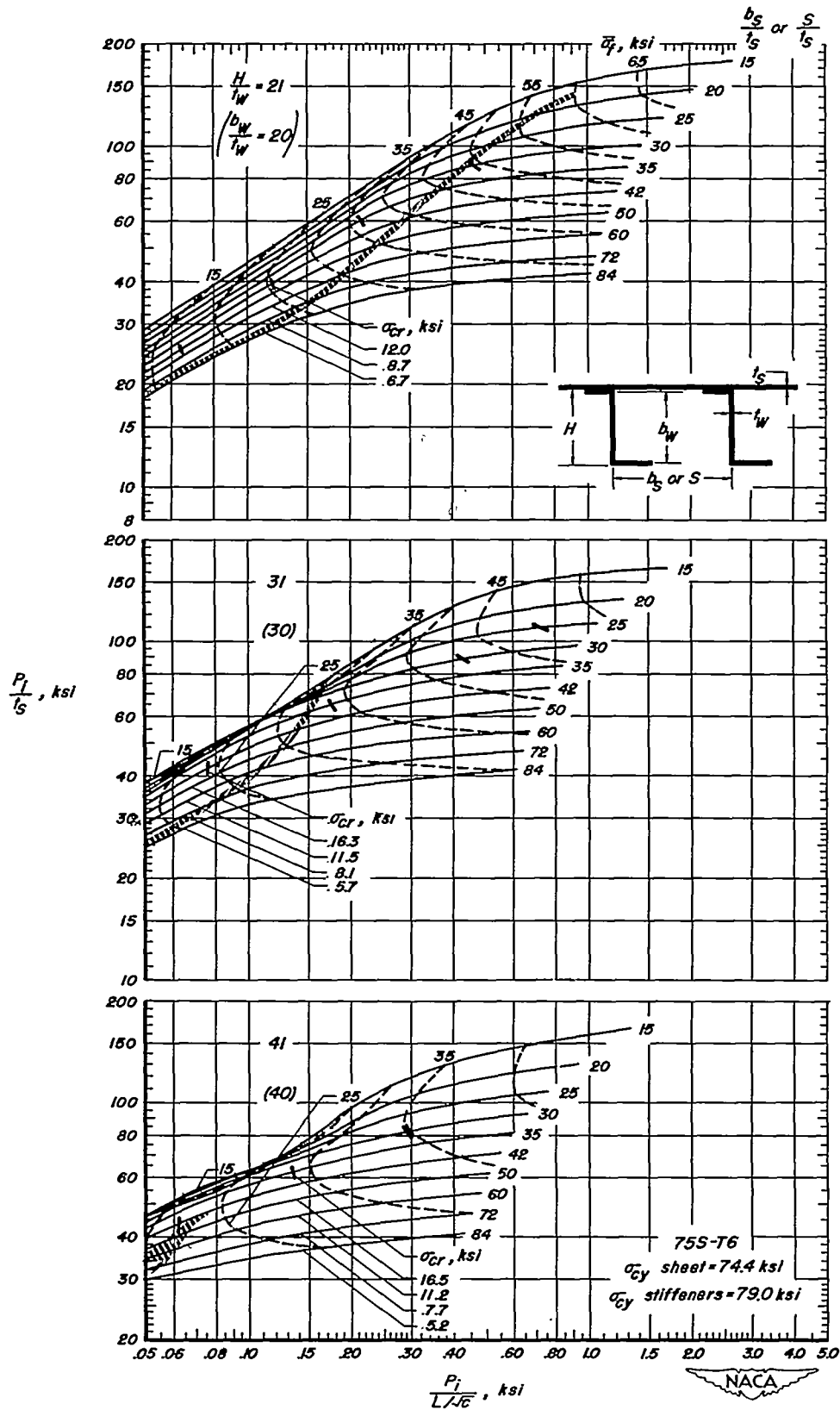


Figure 9.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.79$.

Figure 9.—Concluded. $\left(\frac{t_w}{t_s} = 0.79\right)$

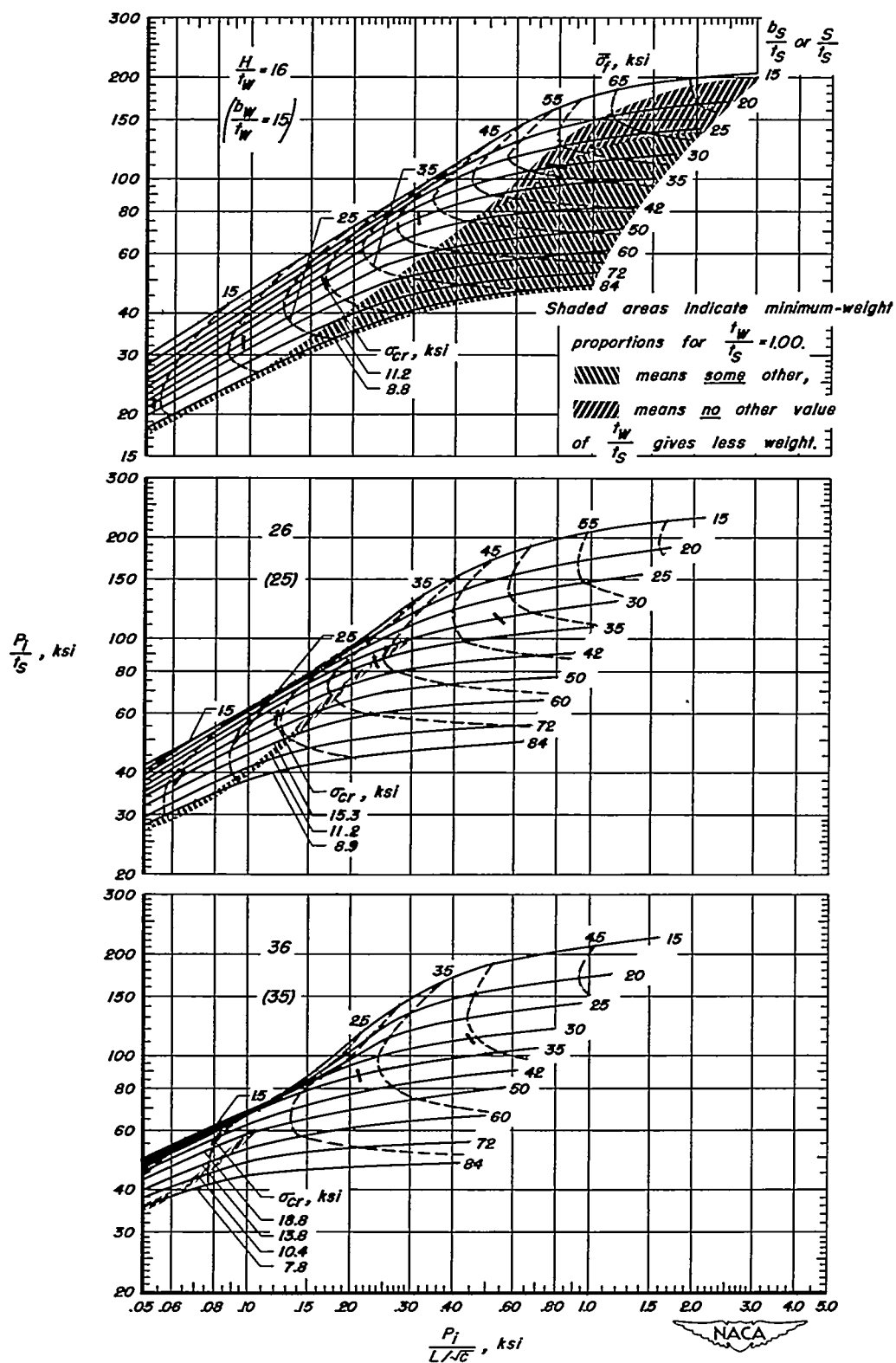


Figure 10.—Direct-reading design chart for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 1.00$.

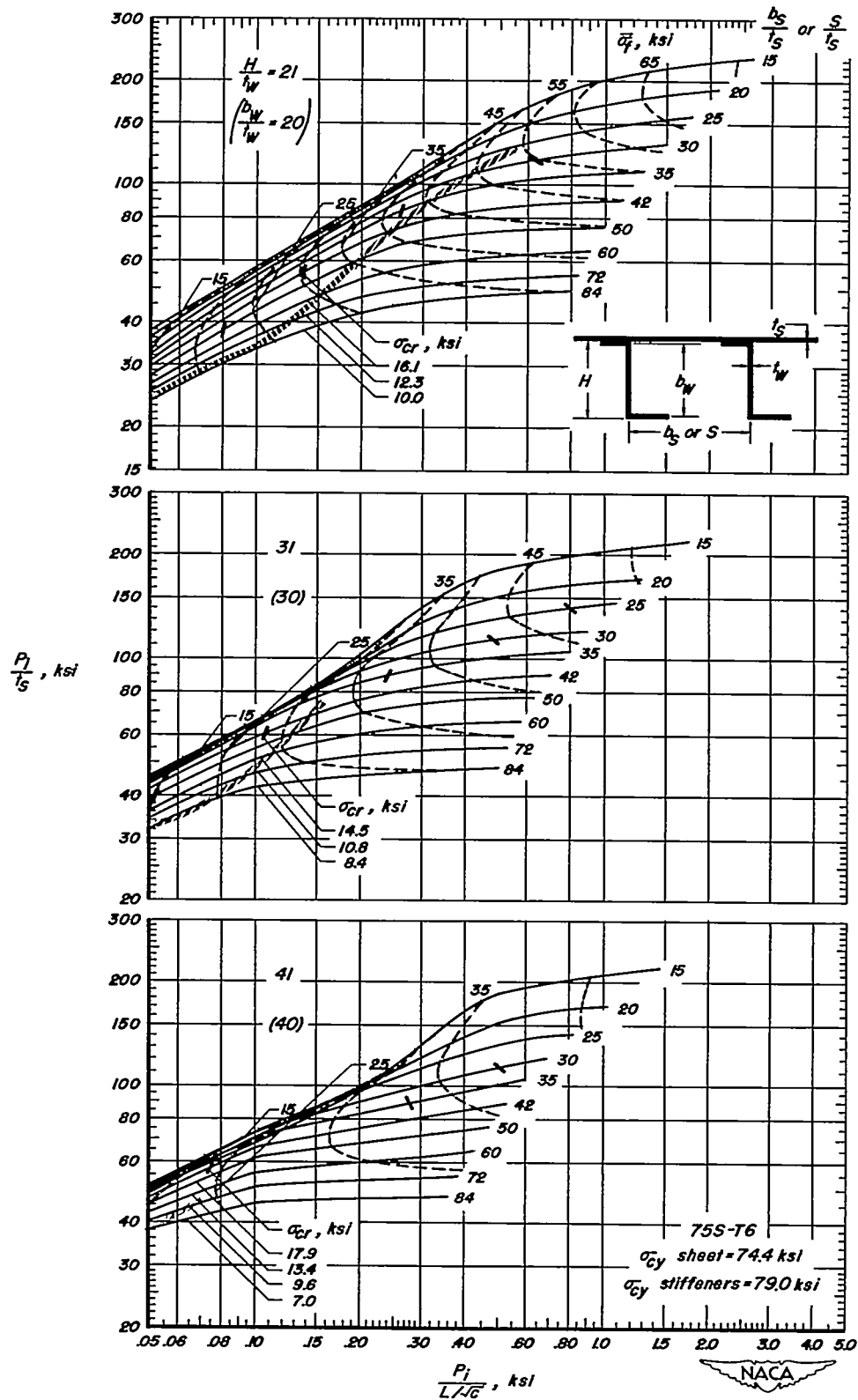


Figure 10.—Concluded. $(\frac{t_W}{t_S} = 1.00)$

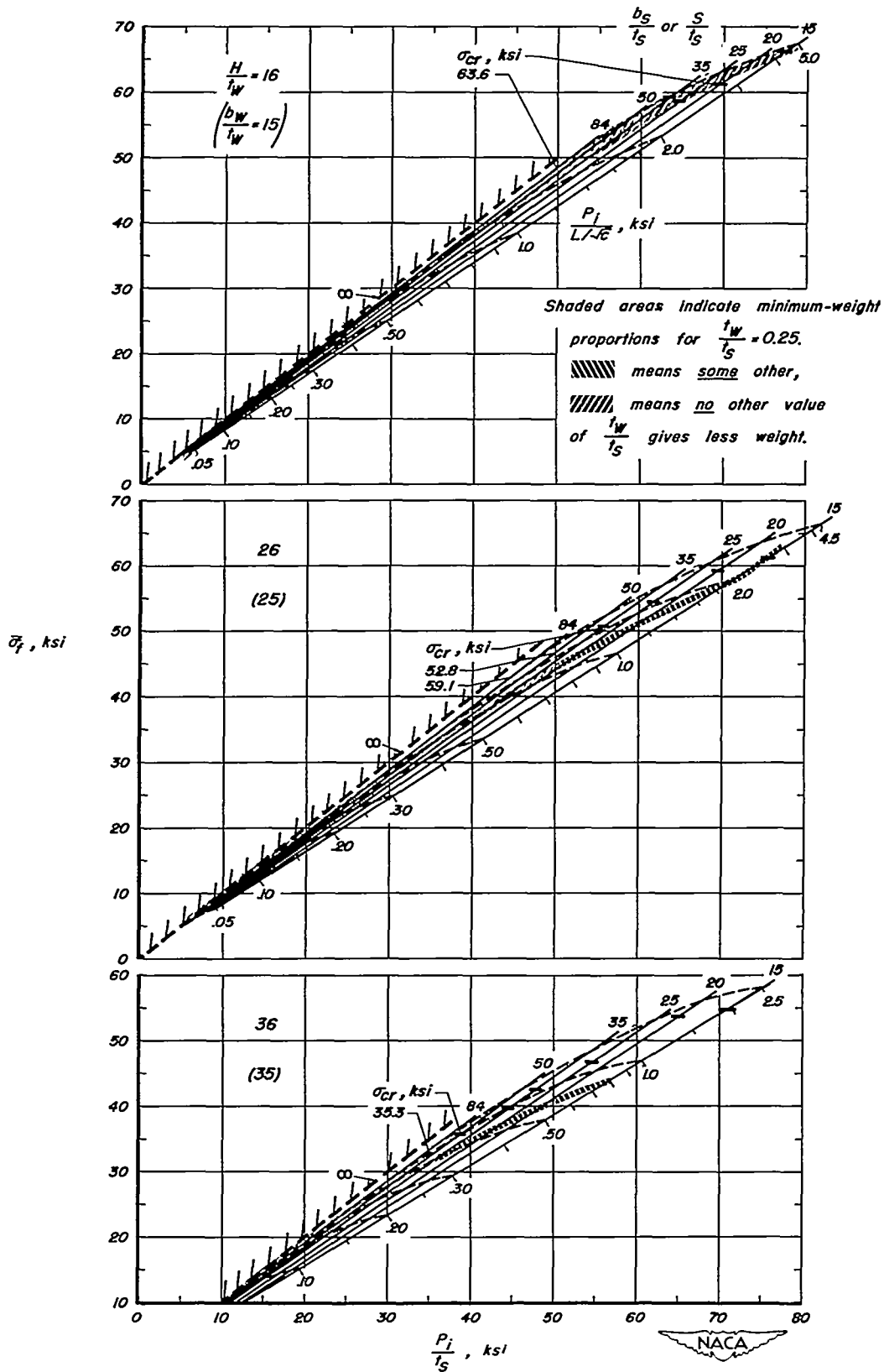
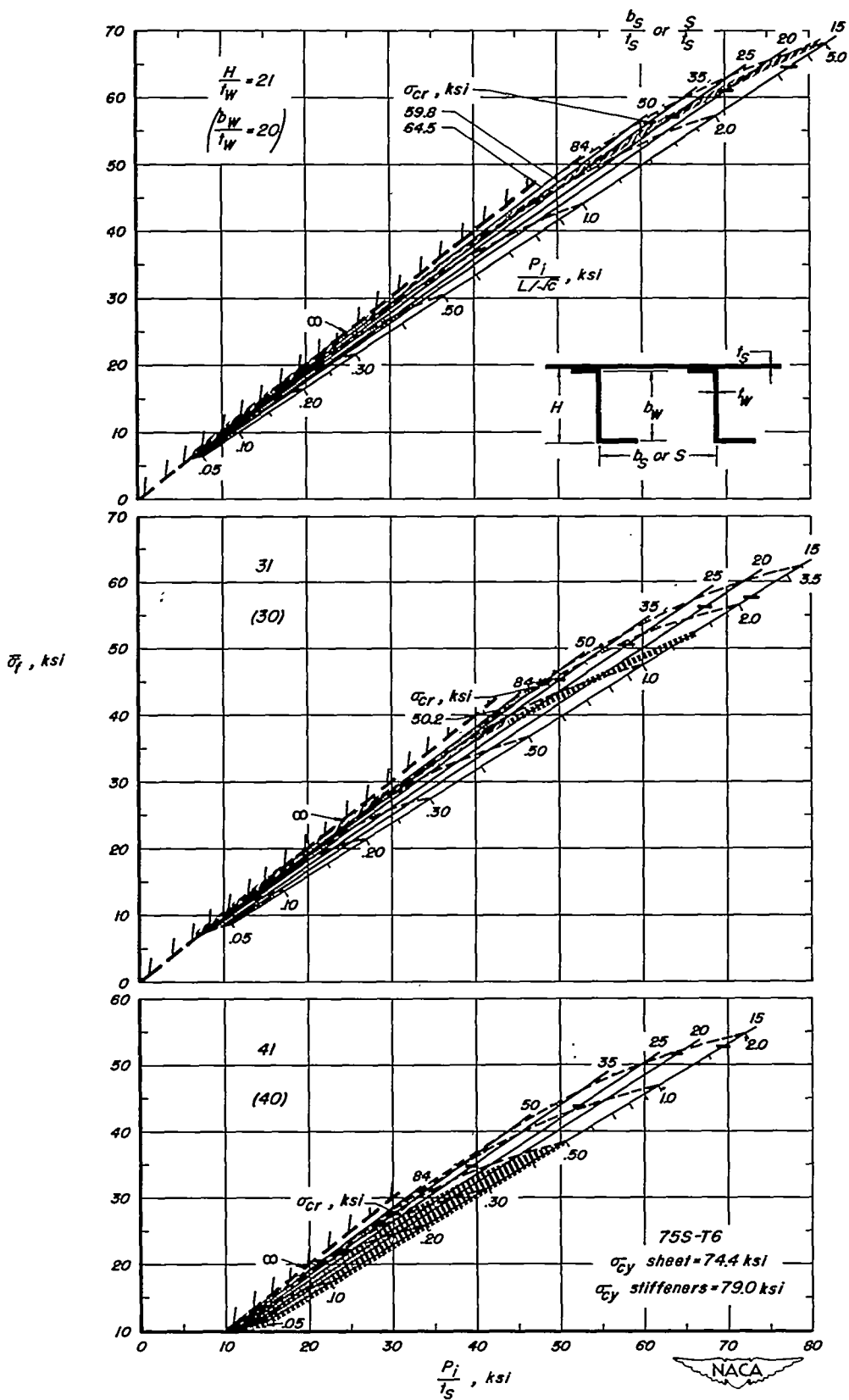


Figure 11.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.25$.

Figure 11.—Concluded. $\left(\frac{t_W}{t_S} = 0.25\right)$

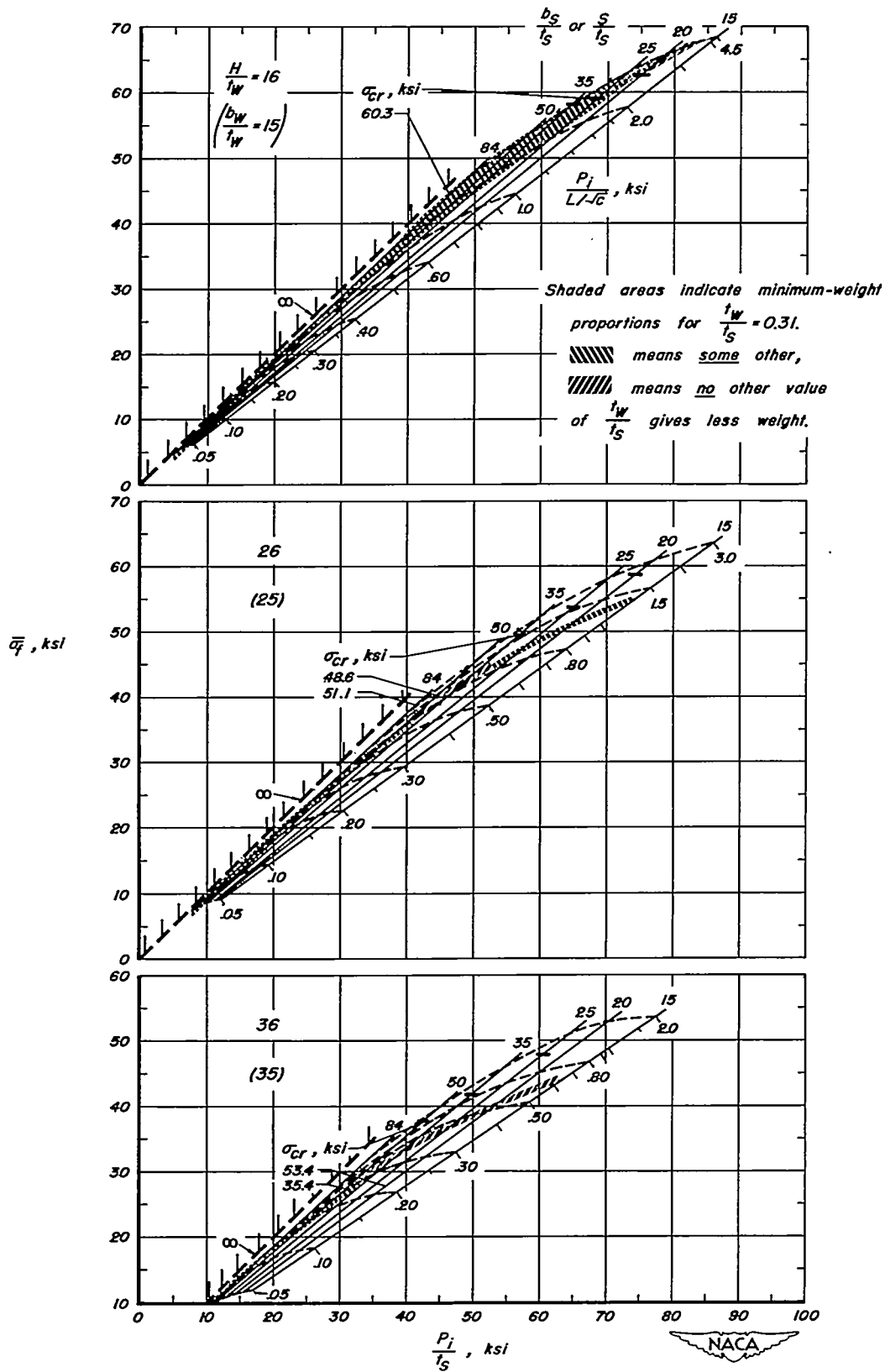
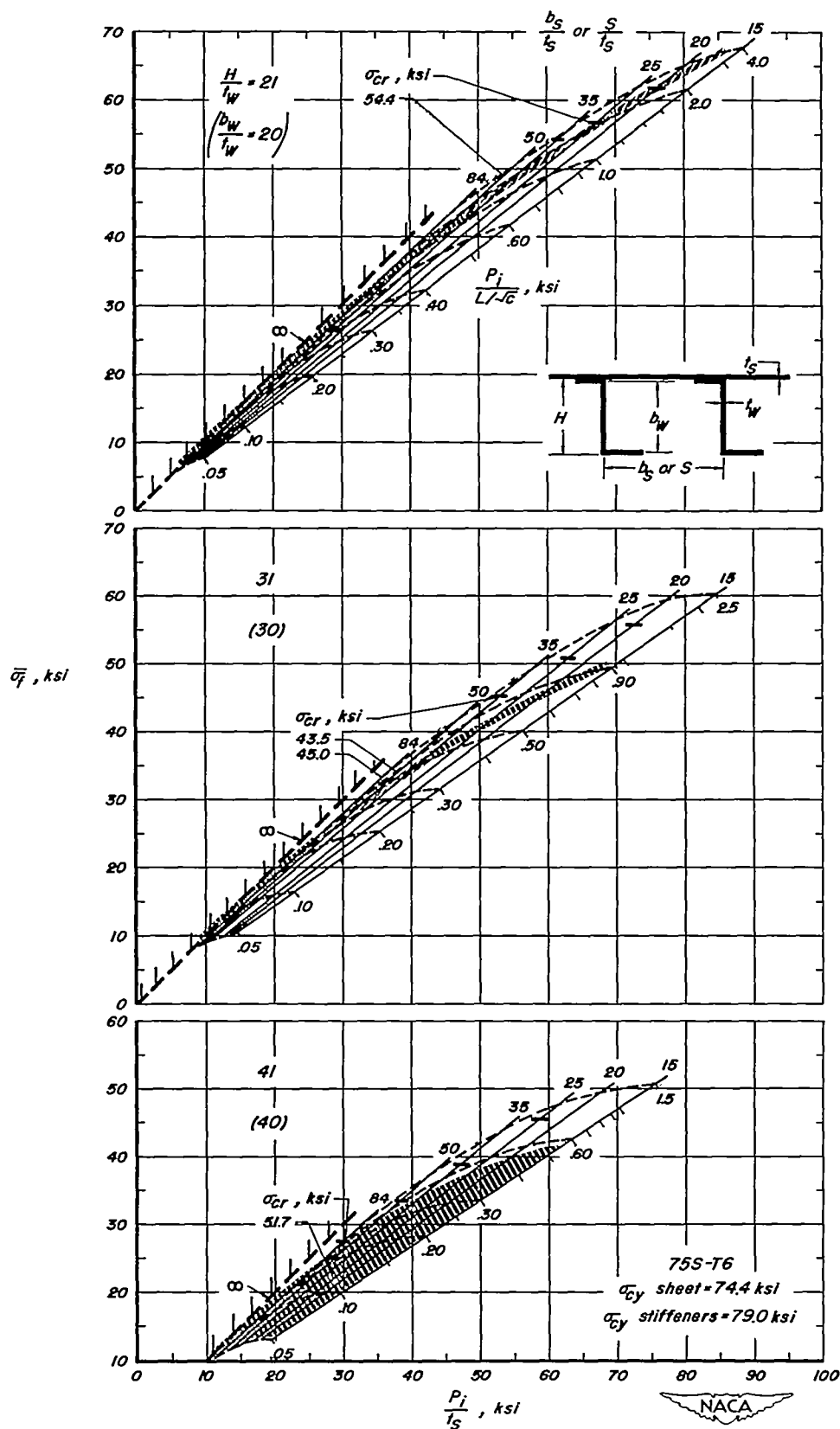


Figure 12.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.31$.

Figure 12.—Concluded. $\left(\frac{I_w}{I_s} = 0.31\right)$

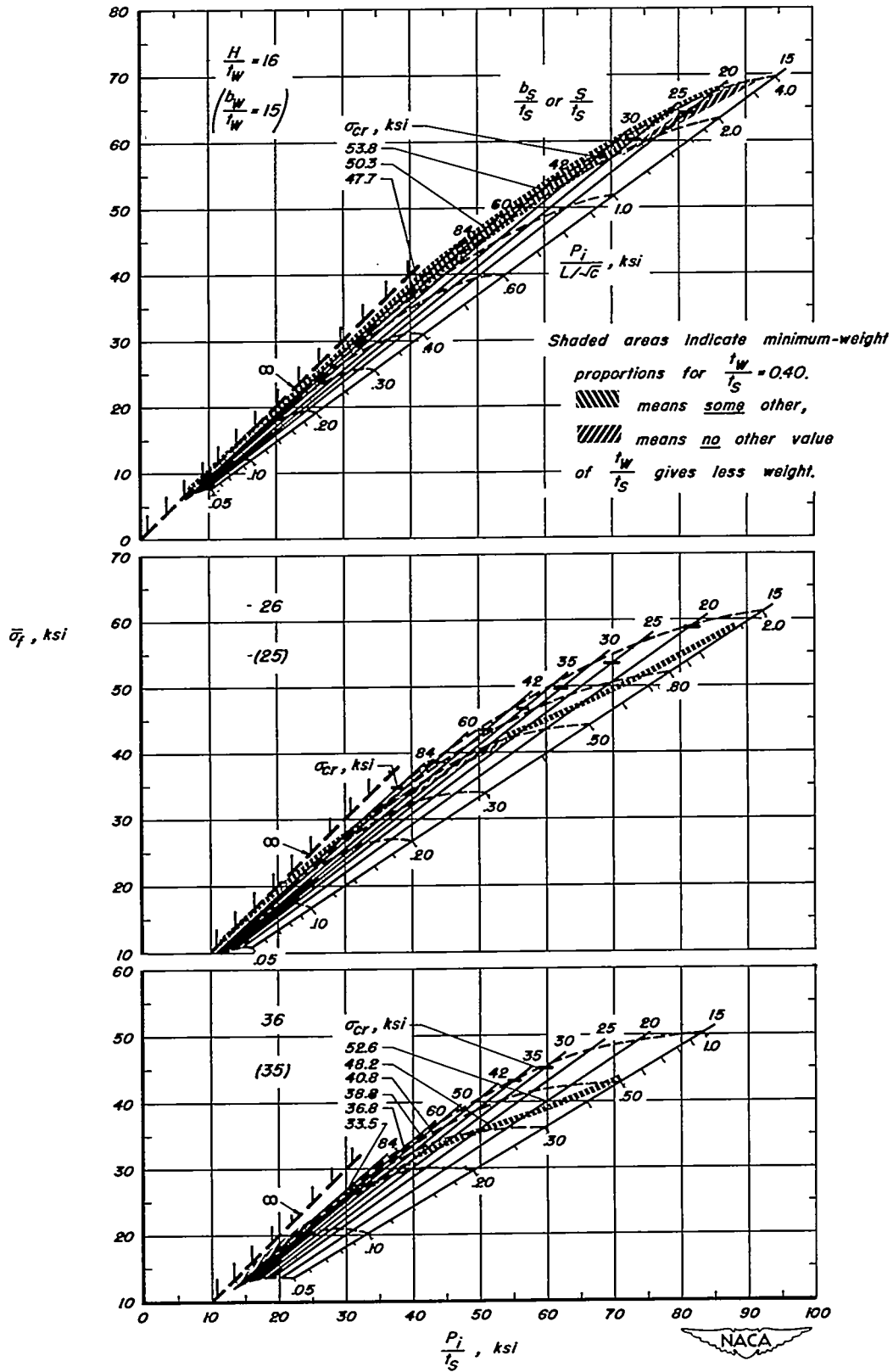
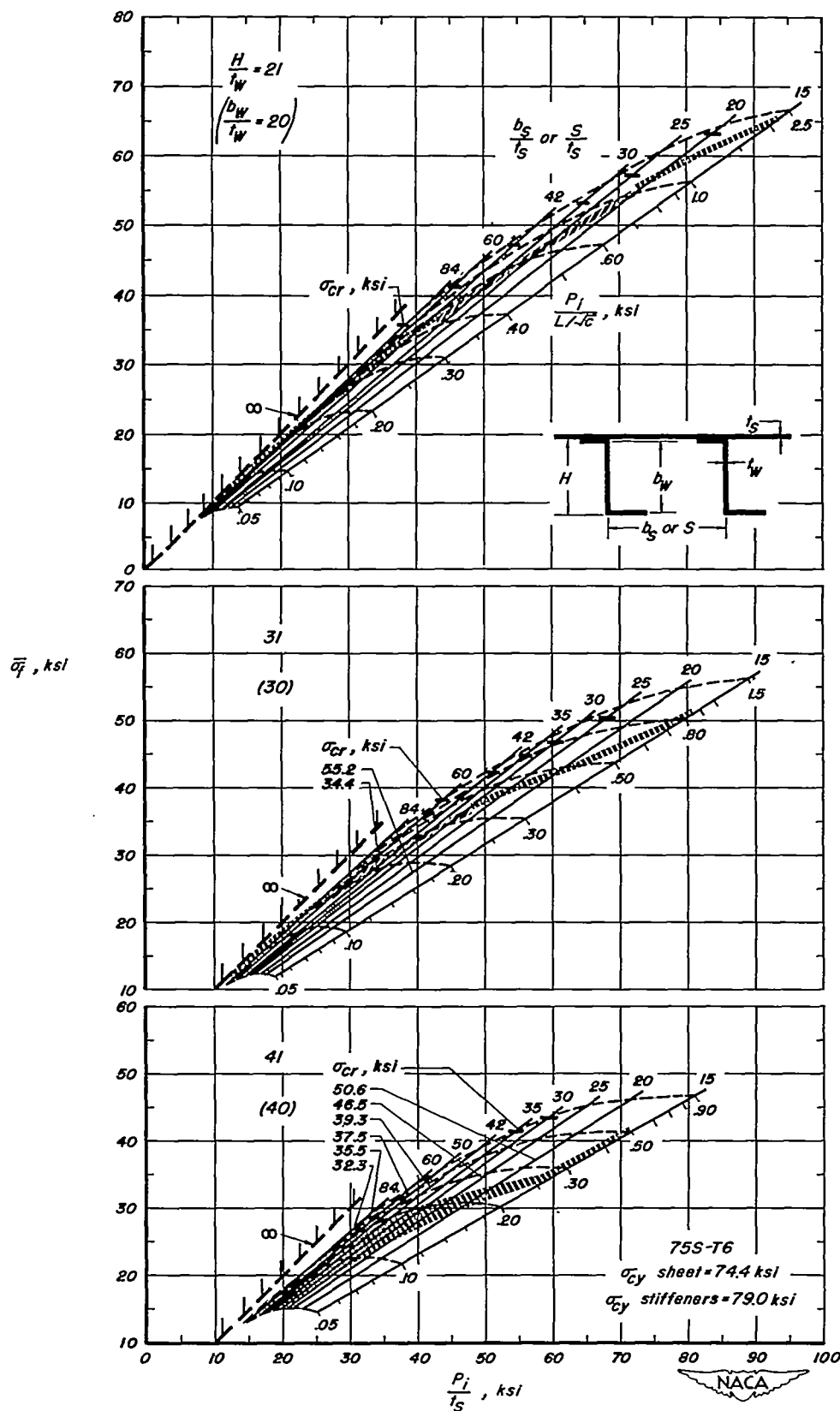


Figure 13.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.40$.

Figure 13.—Concluded. $\left(\frac{t_w}{t_s} = 0.40\right)$

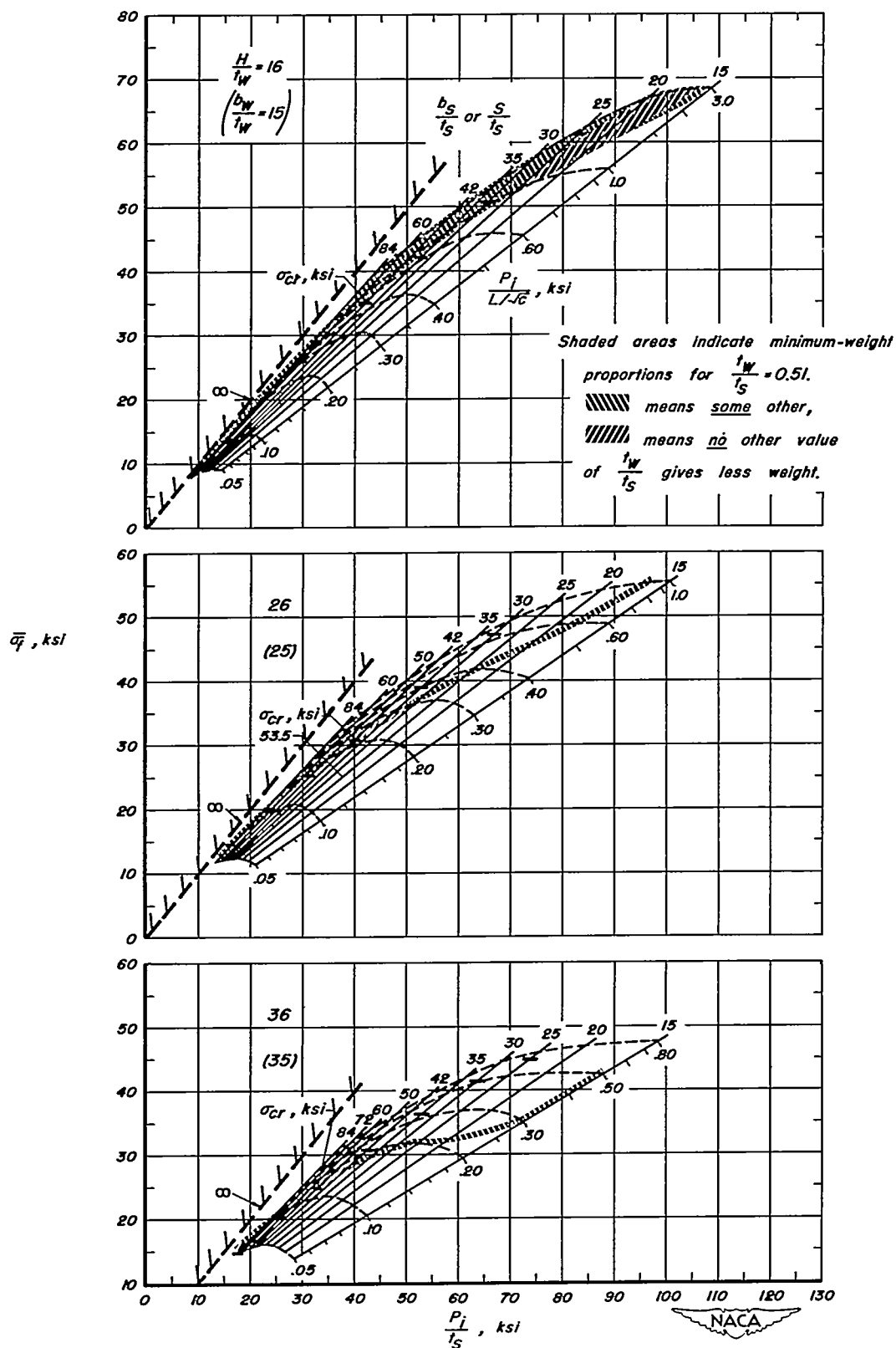


Figure 14.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.51$.

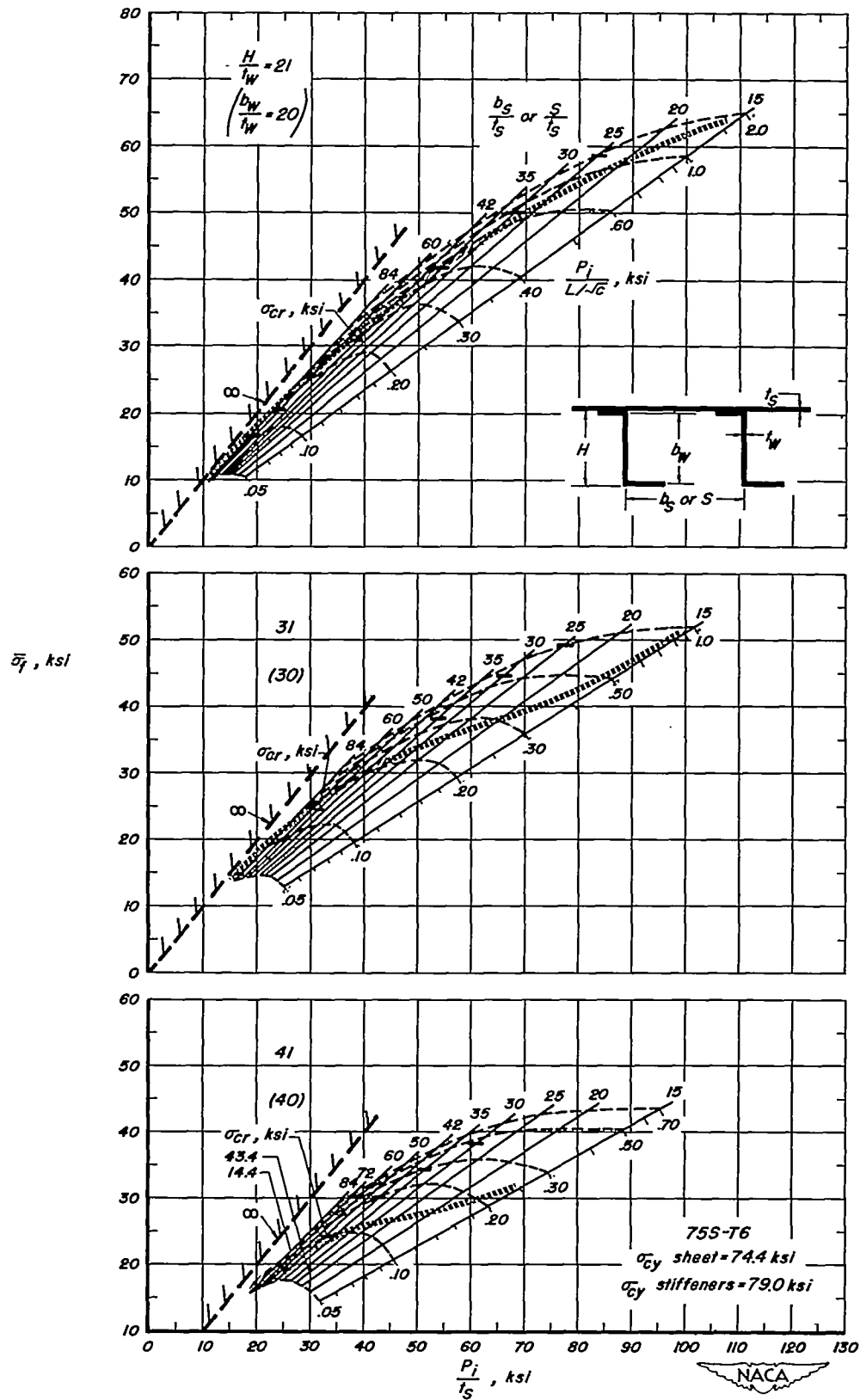


Figure 14.—Concluded. $(t_w/t_s = 0.51)$

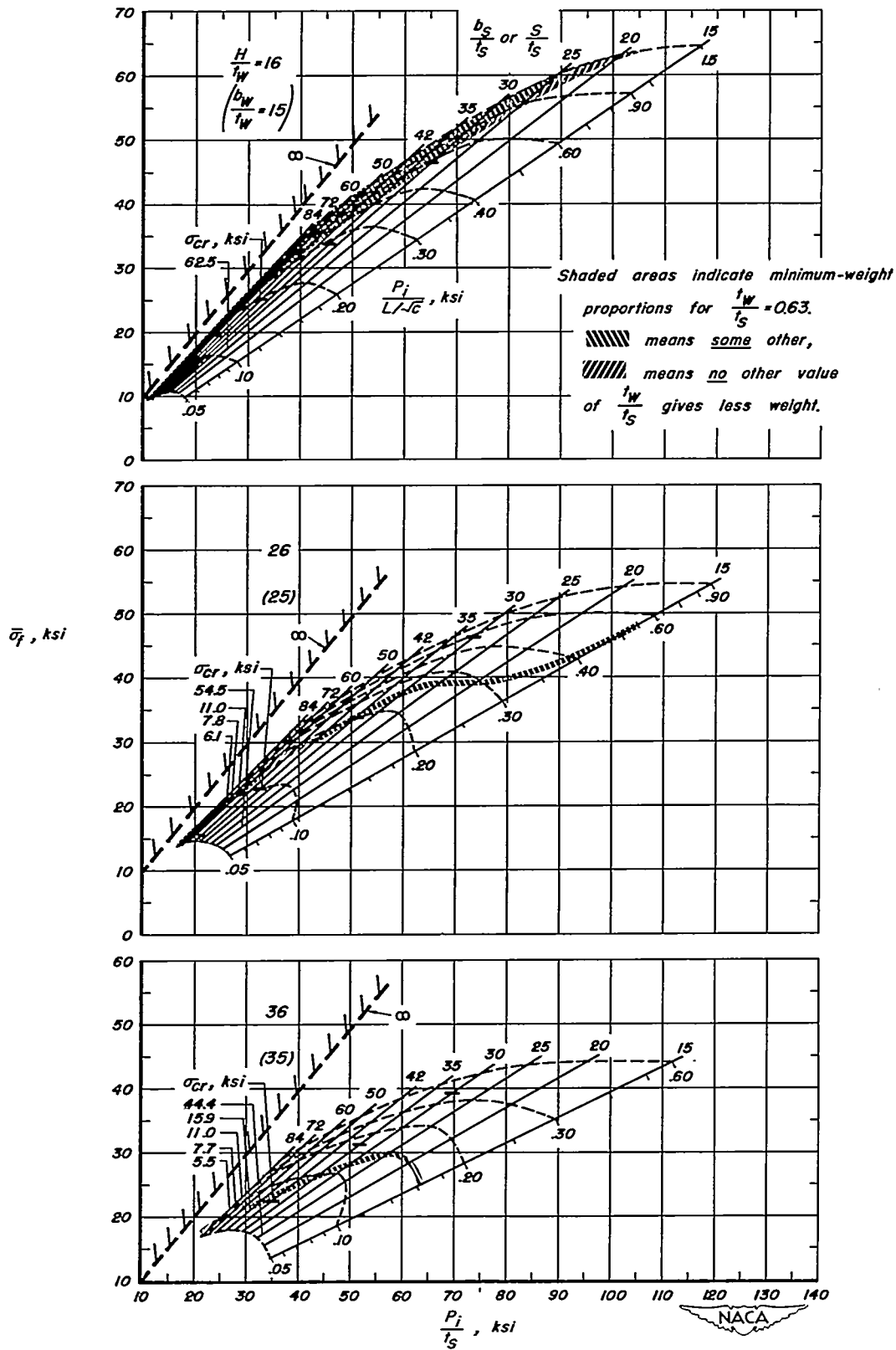
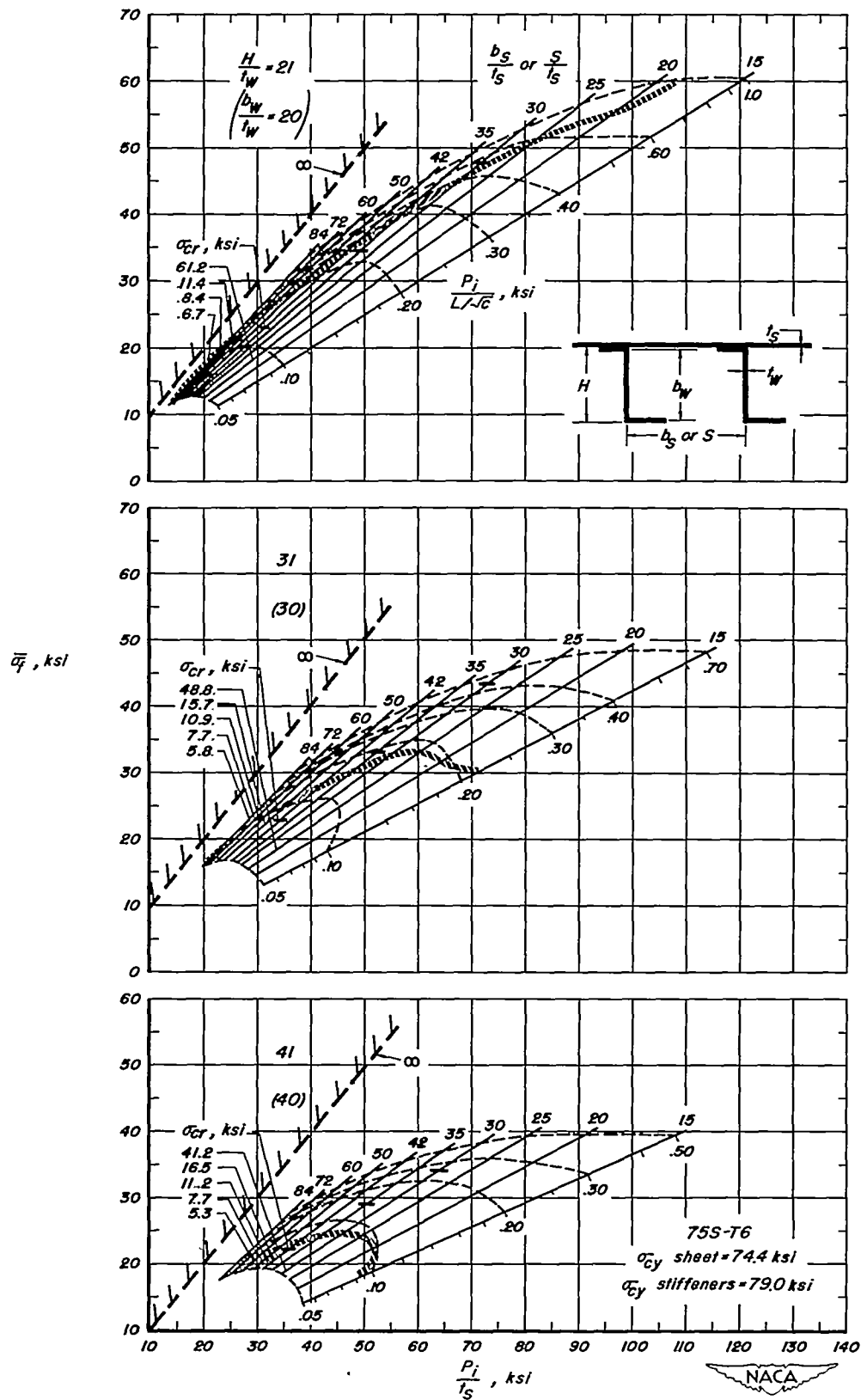


Figure 15.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.63$.

Figure 15.—Concluded, $(t_w/l_s = 0.63)$

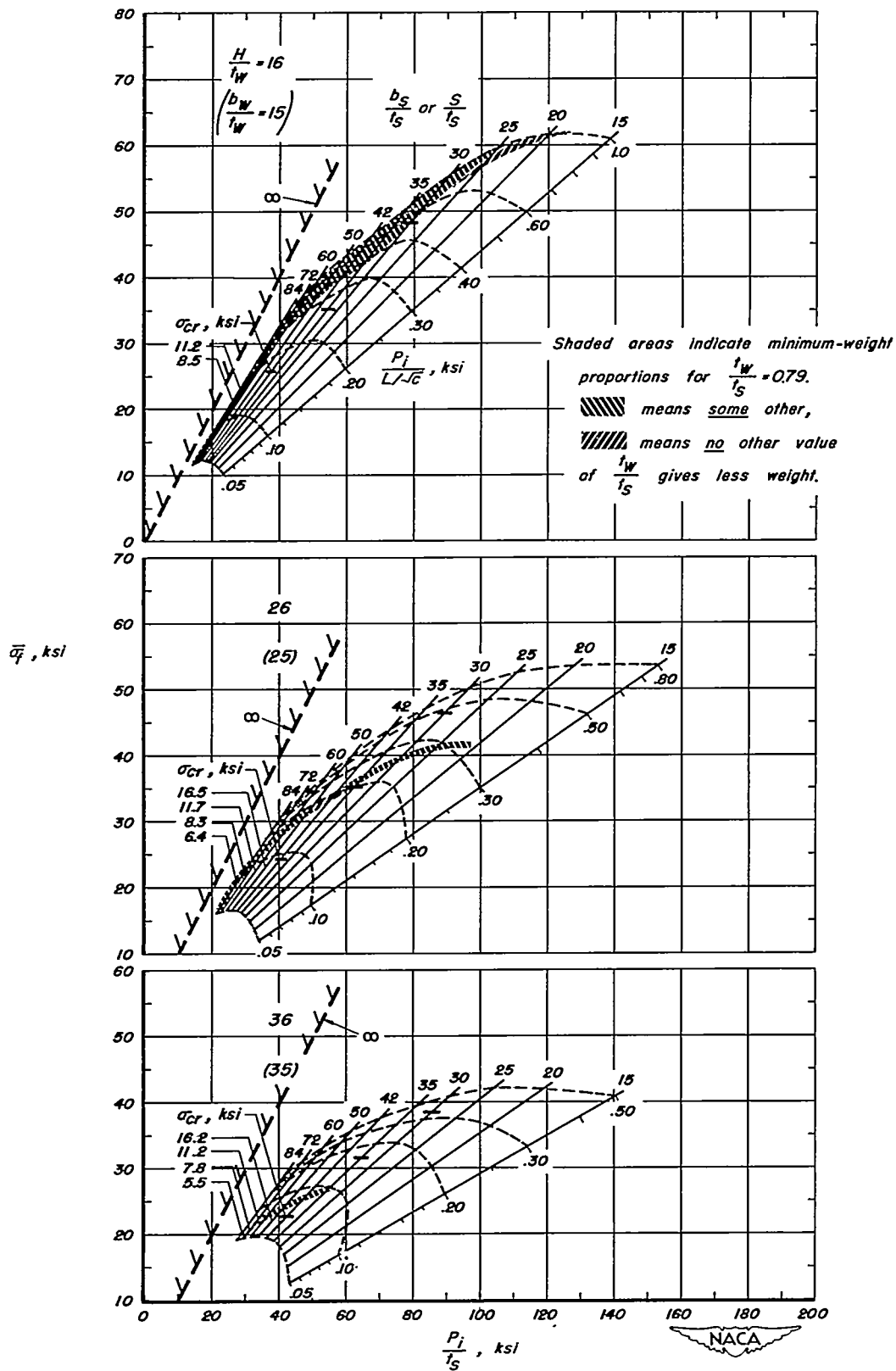


Figure 16.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $\frac{t_w}{t_s} = 0.79$.

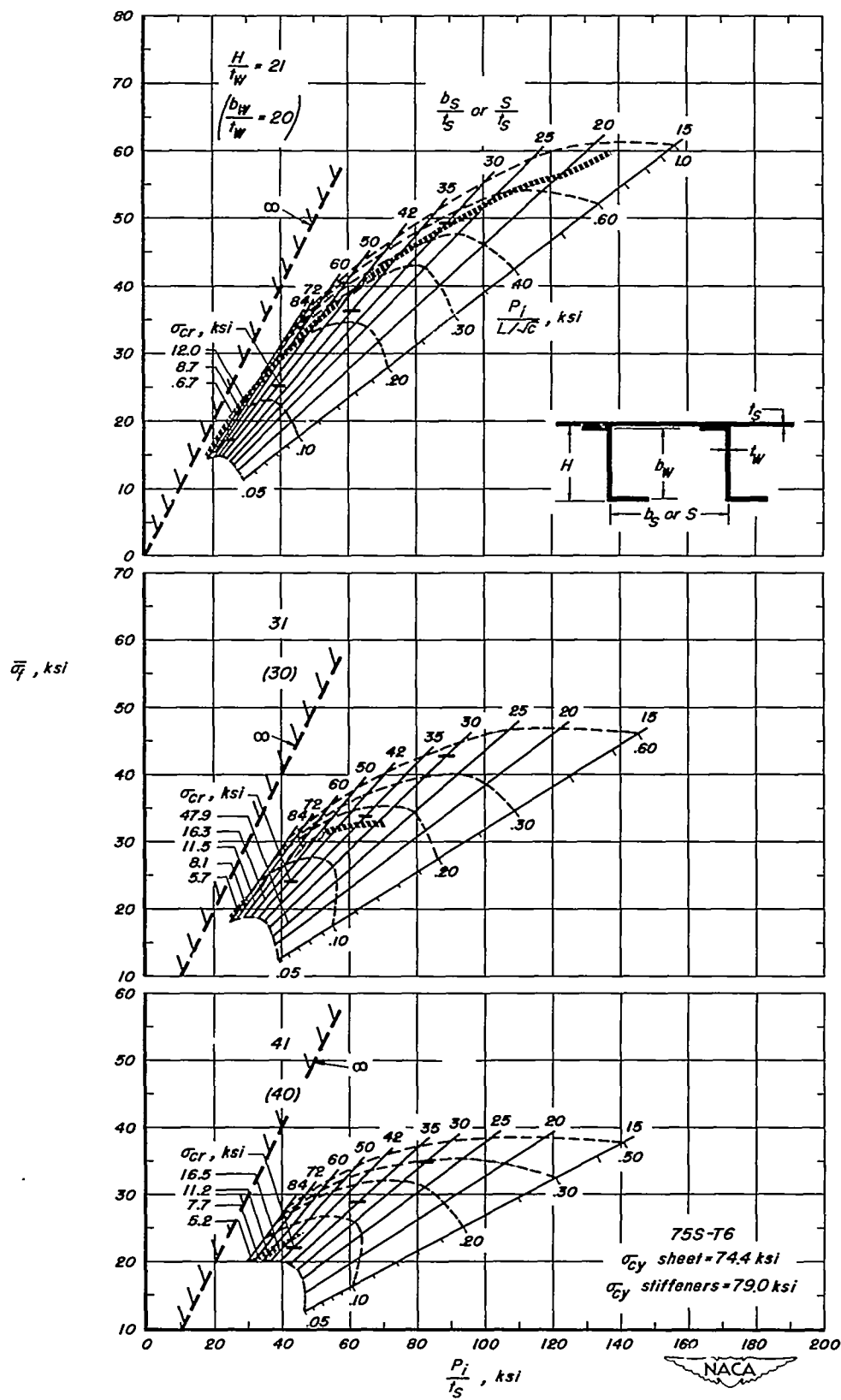


Figure 16.—Concluded. $(t_w/t_s = 0.79)$

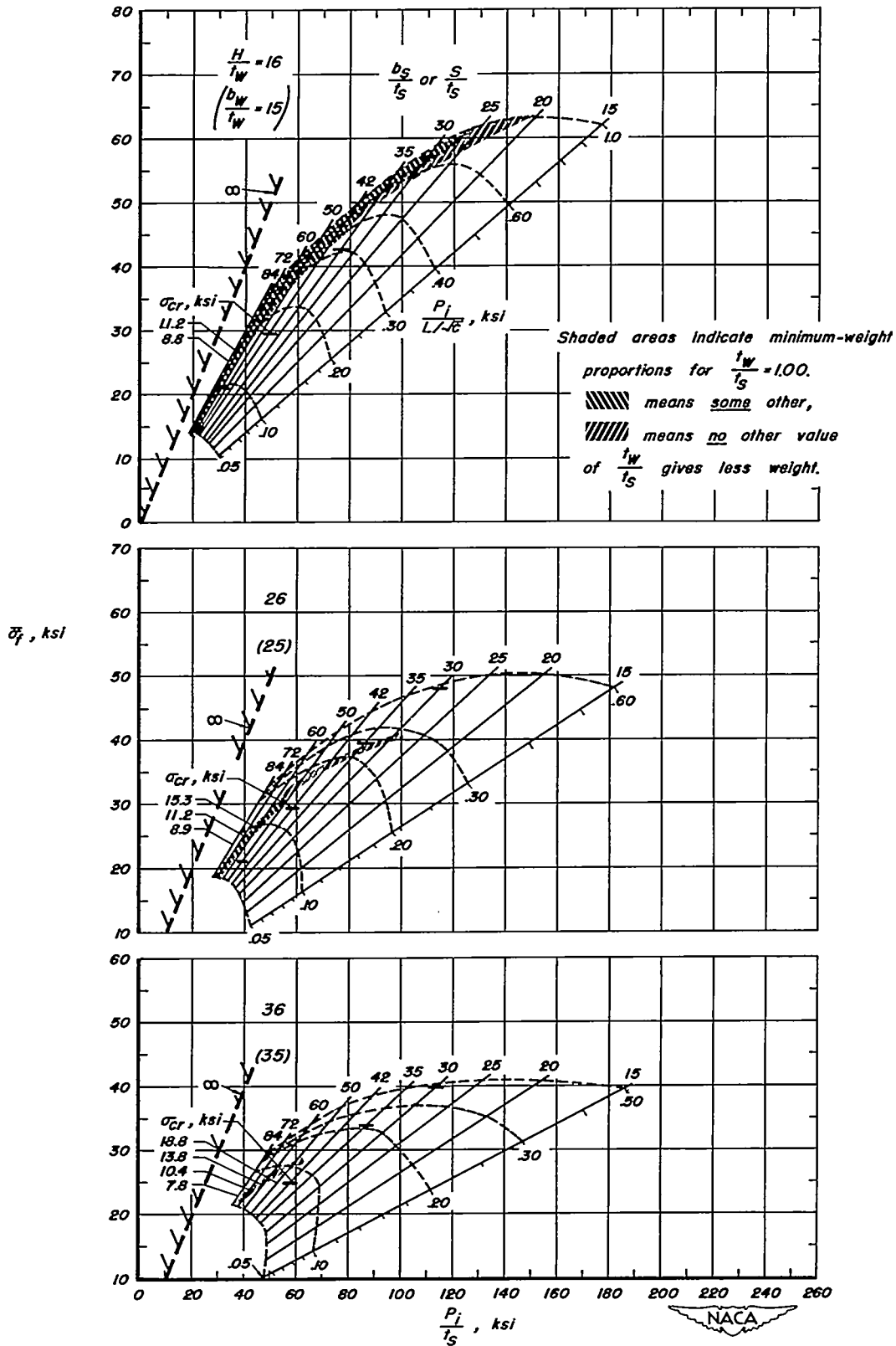
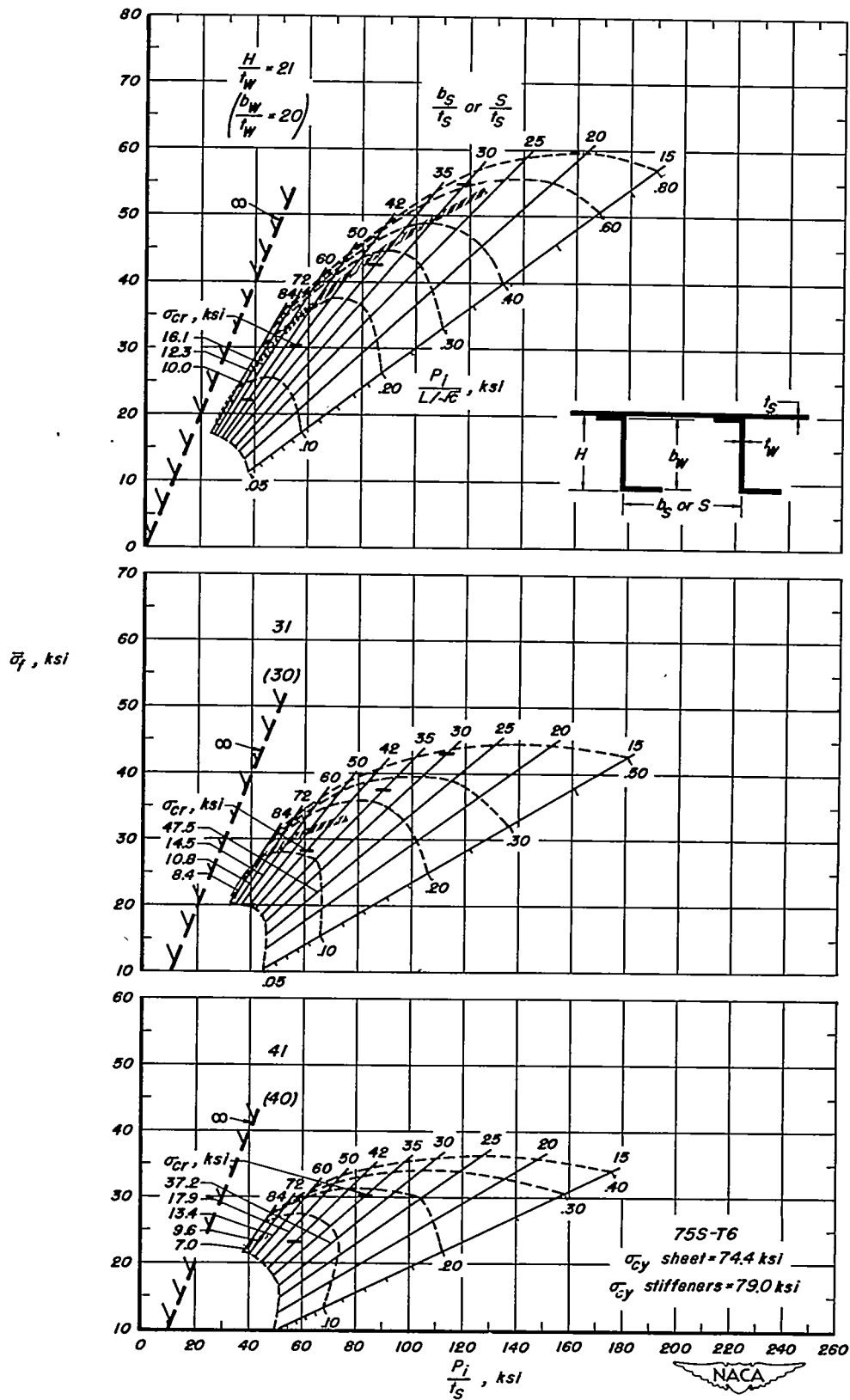


Figure 17.—Direct-reading design chart (alternate form) for flat compression panels of 75S-T6 aluminum alloy with extruded Z-section stiffeners, $t_w/t_s = 1.00$.

Figure 17.—Concluded. $\left(\frac{t_w}{t_s} = 1.00\right)$

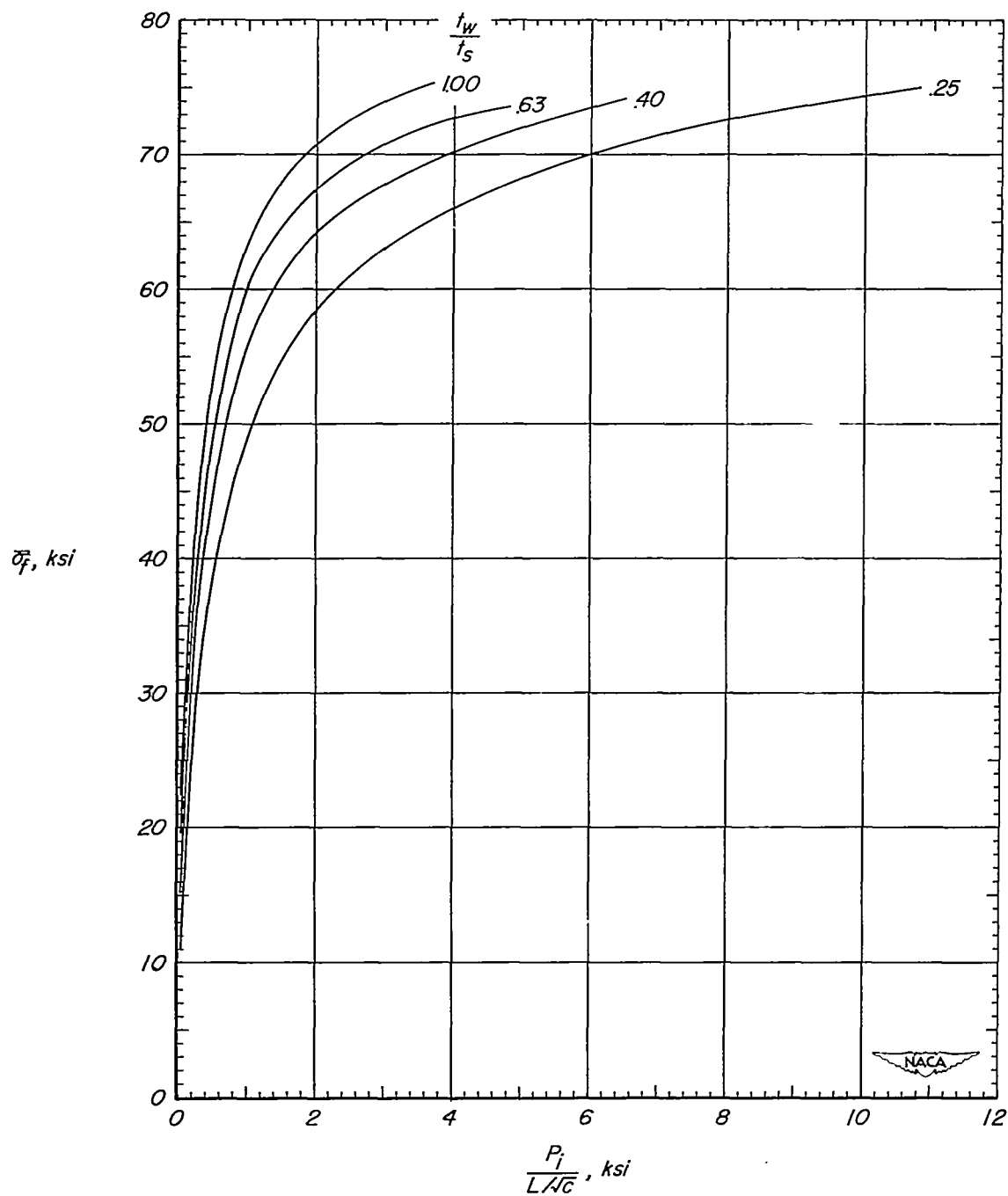


Figure 18.- Highest values of average stress at failure for 75S-T6 aluminum-alloy flat compression panels having extruded Z-section stiffeners.

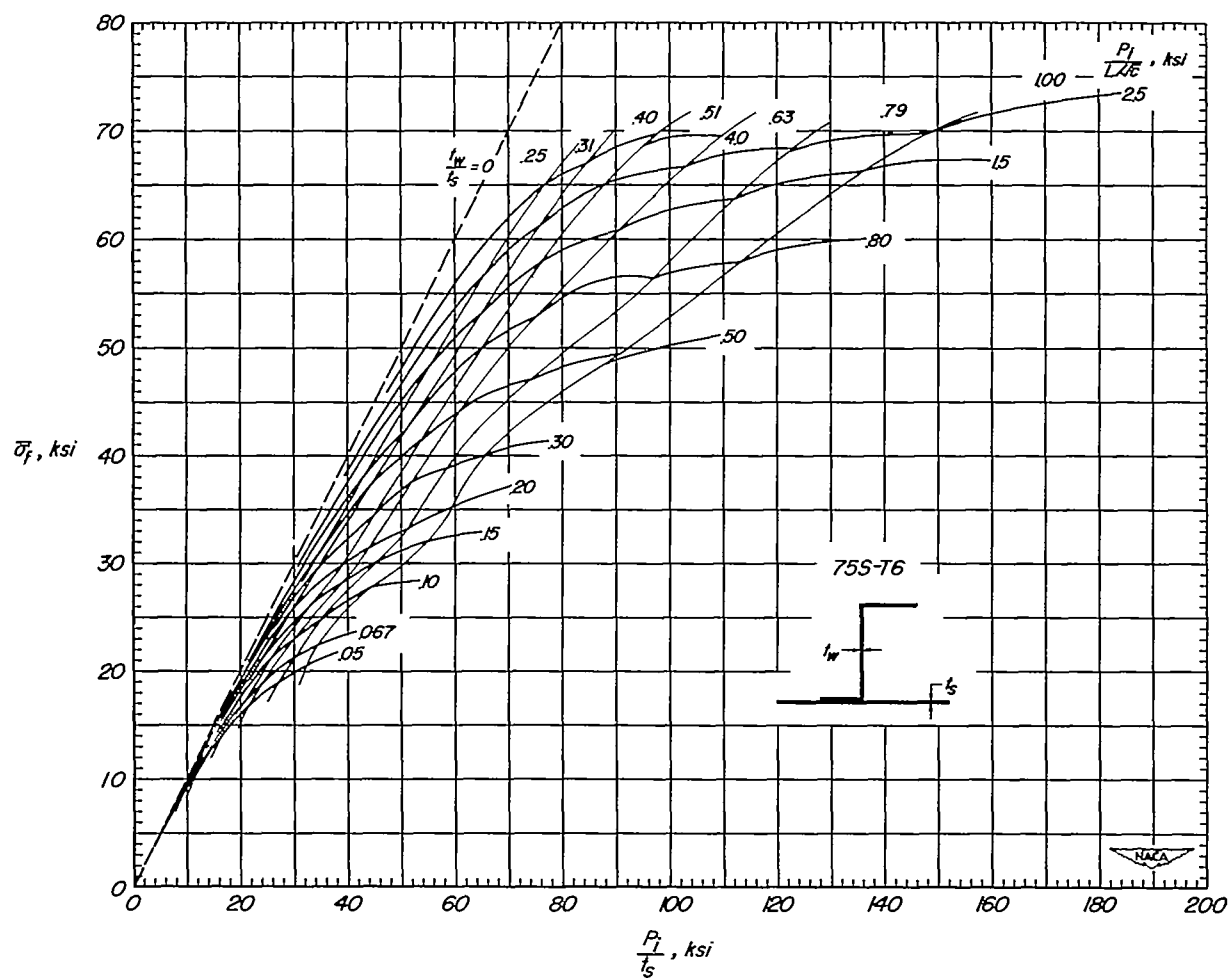


Figure 19.- Design chart for the determination of the average stress at failure that can be carried by minimum-weight designs of 75S-T6 aluminum-alloy flat compression panels having extruded Z-section stiffeners.

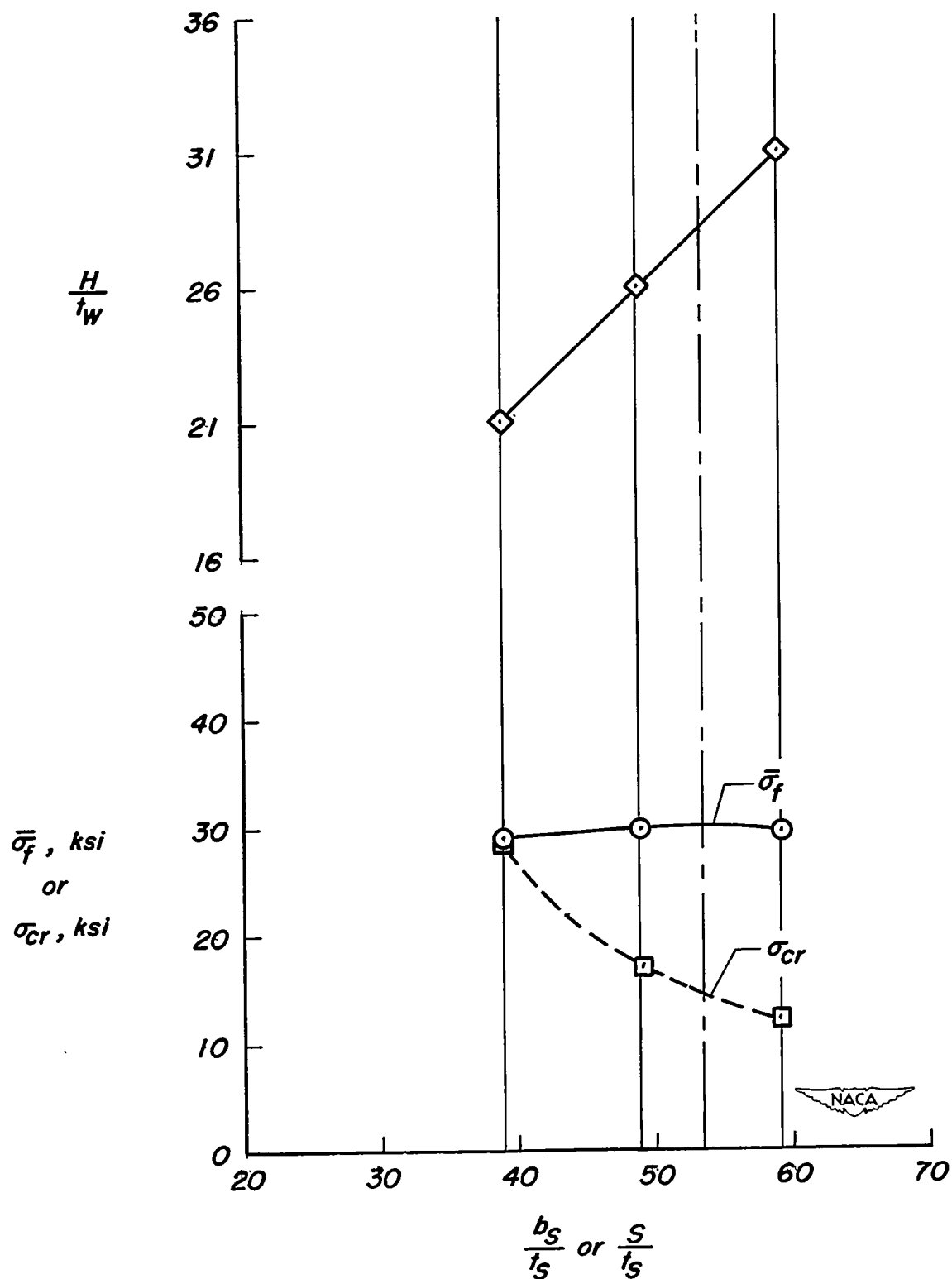


Figure 20.- Plot for obtaining design from design charts.